BLENDED LEARNING:

Research reports
& examples of best practices

Produced within the framework of the project B-Learn – Assisting teachers of traditional universities in designing blended learning (B-Learn)
225565-CP-1-2005-1-EE-MINERVA-M
Coordinated by University of Tartu, Estonia
www.ut.ee/blearn

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Language editing:

ISBN:

Printing House data:

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Acknowledgements

The B-Learn Project has been designed to offer learning and teaching possibilities that integrate traditional learning methods with methods offered by new technology. The idea of the Project was developed from a situation in which the e-learning support personnel of various universities was highly over-occupied and needed something that could help university lecturers – and in this way also educational technologists and other people engaged in developing new teaching opportunities – to design and develop blended learning courses. Integrating research and practical examples offers a good basis for initiating change in universities that by definition are based on research. A number of possible solutions are presented in the following pages.

The writers of this volume, Sofia Torrao from the University of Porto and Saima Tiirmaa-Oras from the University of Tartu, wish to acknowledge the contribution from all the participants in the Project B-Learn. The partnership consisted of:

Jyri Manninen from the Palmenia Centre for Continuing Education, University of Helsinki;

Cecilie Hansen and Konrad Morgan from the Department of Information and Media Science, University of Bergen;

Mart Laanpere from Tallinn University;

Harald Haugen, Bodil Ask and Svein-Ove Lysne from College ICT in Education repr. the NITOL group (Norway-net with IT for Open Learning) Stord/Haugesund University;

Ildiko Mazar from European Distance and E-Learning Network;

Vilma Rūta Mušankovienė, Danguolė Rutkauskienė and Vida Motekaytite from the Distance Education Centre, Kaunas University of Technology;

Lehti Pilt, Aune Valk, Anne Villems and Triin Marandi from the University of Tartu; and

Karin Ruul from the Estonian E-Learning Development Centre.

Current edition is composed and published within the Socrates Minerva B-Learn Project– Assisting teachers of traditional universities in designing blended learning (225565-CP-1-2005-1-EE-MINERVA-M). The Project is carried out with the financial support of the European Commission and considerable contribution from all the partners.

Introduction to the compendium

A few insights to blended learning

Dear Reader,

The volume presents a synthesis of case studies and research within the field of blended learning – a combination of good experience and theoretical knowledge. The term blended learning was first used in American literature and it meant to grasp the blend of traditional teaching and technology based teaching using a wide variety of pedagogical methods and different forms for technology (Gynther 2005). The concept and understanding of the term blended learning is not a homogeneous field within learning theory. The major conclusion to be drawn is that blended learning is difficult to conceptualise as one idea. There are several understandings of the field and consequently many different aspects are investigated. The result is that blended learning is rather one mode to be used within other pedagogical models.

Blended learning is mostly understood as a way of blending face-to-face and technology-based teaching while there are different approaches in introducing blended learning into teaching. The main approach is how to get the two delivery modes into one. The major aspect of finding the right approach is to consider the possibilities, advantages, aspects and different priorities in face-to-face and technology-based teaching.

Blended learning is not a new approach in university teaching. What is new is the sheer range of possible components in a blend. The institutions must decide, through selected criteria, how these components should be blended to produce fruitful blends constantly determining the balance between face-to-face education and technological components in didactical methods. In designing, developing and delivering different types of blends – component, integrated, collaborative or expansive – the learning outcome must be in focus. This must be investigated with a look at learners, culture, learning resources, electronic infrastructure, the scalability and the maintainability of the proposed solution. The B-Learn Project has been designed to offer ways that integrate

traditional strategies with methods offered by the new technology for teaching and learning. The idea is to make it possible for teachers in traditional universities to find new innovative ideas to present and teach in both easy and acceptable ways. The Project has investigated research and practical examples which offer a good basis for initiating change in university pedagogy.

In the current volume the results of the collection of the national cases of blended learning collected from five European countries are presented. These examples are a good method of focusing on what blended learning could be used for. The compendium also contains four research reports which outline different theories on blended learning, examples on how blended learning can be integrated into traditional European universities, examples of different research projects and the use of blended learning in a commercial setting.

The project partnership believes that this introduction of blended learning models, theories and best practice will enhance the development of the future didactical approaches in traditional universities by offering broadbased insight into blending traditional teaching methods with technology. The primary target groups are seen to be the users of blended learning (teachers, students, instructional designers, educational technologists) mostly from higher education institutions, but from other types of institutions as well.

We wish to give our gratitude to all the people who worked within the partnership to collect and synthesise the data for the current edition. Our special thanks go to all the lecturers who demonstrated their blended learning courses for analysis and therefore made it possible for our Readers to benefit from their experience.

Theories on ‘Blended Learning’

Introduction

This deliverable outlines the major findings of the literature review on blended learning. The report is divided into three parts, each focusing on different aspects of the phenomenon. As an introduction different terms and definitions of blended learning will be reviewed. The second part outlines different pedagogical theories using blended learning. In the third part some approaches to introducing blended learning as a didactical method are reviewed. The major finding of the literature review is that blended learning is difficult to conceptualise as one idea. There are several understandings of the field and consequently many different aspects are investigated.

'Blended Learning' - what is it?

Numerous articles and books deal with the theory of blended learning. The term itself refers to diverse aspects of learning and teaching. When studying the term, it is obvious that there is not only one definition or approach referring to the term. Another feature accompanying the phenomenon is that the term blended learning has no clear translations in other languages. The question could then be if other cases investigating and researching similar questions, not defined as blended learning, still deal with blended learning. It is possible to give a positive answer to this question if the research corresponds to the definitions of what blended learning is. To define research not using the term itself would be a major methodological task and this deliverable will therefore be based only on research where the term blended learning is used.

As many other authors, Gynther (2005) also claims that the gap previously existing in traditional- vs. web-based-, distant- or virtual learning is disappearing. In the near future all teaching will be supported by more or less digital or net based flexible solutions in their educational organisation.

A virtual dimension is on its way into all sorts of education, either still experimenting with it or already implementing it. The term blended learning is of American origin. It grasps the blend of traditional teaching and technology based teaching using a wide variety of pedagogical methods and different forms of technology.

Josh Bersin's (2004) book, The Blended Learning Book: Best Practices, Proven Methodologies and Lessons Learned gives a definition of blended learning as the combination of different training "media" (technologies, activities, and types of events) to create an optimum training program for a specific audience. Bersin uses the term blended learning as traditional instructor-led training being supplemented with other electronic formats where blended learning programs use many different forms of e-learning, perhaps complemented with instructor-led training and other live formats.

Many of the authors using the term blended learning write "how-to-do" books basically for the company-audience. Bersin himself is in this category but also Kaye Thorne (2003) who considers blended learning as the most logical and natural evolution of our learning agenda. He finds blended learning an elegant solution to the challenges of tailoring learning and development to the needs of individuals representing an opportunity to integrate the innovative and technological advances offered by online learning with the interaction and participation offered in the best of traditional learning. It can be supported and enhanced by using the wisdom and one-to-one contact of personal coaches.

In Thorne's book Blended learning: how to integrate online & traditional learning blended learning is defined as the mix of traditional forms of classroom training and one-to-one coaching with:
• Multimedia technology
• CD ROM video streaming
• Virtual classrooms
• Voicemail, email and conference calls
• Online text animation and video-streaming

As mentioned above, many of the books within the field of blended learning have a "how-to-do" approach with (private) companies as their main audience and deal with how the concerned companies can make training more efficient, less cost- and time demanding as their subject matter. These books address the reader in a very informal, non-academic style with phrases like "How can it help? Is it right for your organisation? How can you implement it?" They propagate blended learning as the training method for companies suggesting blended learning is hype, is new and solves nearly all training problems.

In addition to the "how-to-do" books, there are of course also several academic articles dealing with the term. Whitelock & Jelfs (2003) opened a journal special issue on blended learning where they introduced three definitions of the term:

1. the integrated combination of traditional learning with web-based online approaches;
2. the combination of media and tools employed in an e-learning environment; and
3. the combination of a number of pedagogical approaches, irrespective of learning technology use.

Of these, the first is considered by Singh (2003 in Oliver & Trigwell 2005) as the most common interpretation. The second is also widespread, although sometimes advocated in a more general form as concerning models that combine various delivery modes, rather than privileging e-learning. Oliver & Trigwell find that Singh gives a more substantial description that elaborates on the third possibility, based on what he sees as a much richer set of learning strategies or dimensions that can be blended in ways such as: offline with online; self-paced with live, collaborative; structured with unstructured; custom content with off-the-shelf; and so on.

Another approach is presented by Kerres & De Witt (2003). They discuss blended learning as a mix of different didactic methods and delivery formats. Their argumentation is based on the assumption that these two are independent of each other.

Oliver and Trigwell mention all of these articles but also refer to Driscoll's summary of her book (2002) in which she identifies four different 'concepts' denoted by this term:

4. combining or mixing web-based technology to accomplish an educational goal;
5. combining pedagogical approaches (e.g. constructivism, behaviourism, cognitivism) to produce optimal learning
6. outcome with or without instructional technology;
7. combining any form of instructional technology with face-to-face instructor-led training; and
8. combining instructional technology with actual job tasks.

"The point is that blended learning means different things to different people, which illustrates its widely untapped potential" writes Driscoll (Oliver and Trigwell2005). Oliver and Trigwell find the explanation offered by Hofmann (2001) more precise.

She proposes that “the idea behind blended learning is that instructional designers review a learning program, chunk it into modules, and determine the best medium to deliver those modules to the learner”. Oliver and Trigwell introduce one last perspective provided by Valiathan (2002), describing blends in terms of the focus for learning, or ‘intended’ learning:

1. skill-driven learning, which combines self-paced learning with instructor or facilitator support to develop specific knowledge and skills;
2. attitude-driven learning, which mixes various events and delivery media to develop specific behaviours; and
3. competency-driven learning, which blends performance support tools with knowledge management resources and mentoring to develop workplace competencies.

Oliver and Trigwell are critical of the use of the term blended learning in all contexts because they find that the feature shared by all of these examples and definitions is that they are all described from the perspective of the teacher, the instructor or the course designer.

The main result of this investigation into the use of the term of blended learning based on the articles from Oliver and Trigwell (2005), Whitelock & Jelfs (2003) and several others shows that the concept and understanding of the term blended learning is not a homogeneous field within learning theory.

Learning theory:

Another aspect of blended learning is its approach to the pedagogical theories. The theory of blended learning does not seem to “belong” to one learning theory but is rather a method used within different pedagogical approaches. In the articles describing blended learning, different pedagogical theories are used (Oliver and Trigwell 2005, Whitelock & Jelfs 2003). Hiltz and Murray (2005) present online learning as the latest in a long list of social technologies that have been introduced to improve distance learning by adding various augmentations, substitutions, or blending of new pedagogical approaches and technologies. The authors find online learning revolutionizing higher education both as a process and as a social institution. They describe online learning as a new social process that is beginning to act as a complete substitute for both distance learning and the traditional face-to-face class. Substituting both because it is a process that will infiltrate the ordinary face-to-face class and because it will radically change the nature of what is thought of as the typical college course.

Roberts (2004) stresses how ‘blended learning’ recently has come into fashion as a supplement to existing traditional lectures and tutorials by enabling external students to learn efficiently. He finds the two trends very apparent to all involved in the learning process. First, he describes the vast increase in the use of web-based materials to support courses. Secondly, many educators find interaction as the key component of the learning process for many learners. He finds the field of computer-supported collaborative learning (or CSCL) is the attempt to bridge the gap between interaction and learning, and stands as a paradigm of learning that seems likely to become pre-eminent in the twenty-first century.

Thorne (2003) finds blended learning is a way of making learning more individualized referring to Haward Gardner on how people respond positively to different learning stimuli. In this way organizations and schools can give people different ways of working by means of giving them freedom to be themselves. Other pedagogical approaches widely used are the activity theory and the social constructive learning theory (Bjarno 2005).

Taradi et al. (2005) introduce blended learning as one of three educational options in higher education. The three pedagogical principles are (Web)-based learning (WBL), Problem-based learning (PBL), Collaborative learning. Taradi gives a definition of blended learning saying a blended (hybrid) course combines traditional face-to-face and WBL approaches in an educational environment that is non-specific as to time and place.

Alonso et al. (2005) miss the effort of finding solutions to psychopedagogical problems in new educational category and claim that a psychopedagogical instructional model based on content structure is the latest in information processing psychology and social constructivism. The authors define a blended approach to the learning process. Technologically speaking, the instructional model is supported by learning objects, a concept inherited from the object-oriented paradigm.

Gynther (2005) points out that the term blended learning puts four different didactical questions in focus:

1. What kind of knowledge should the students get and what kind of pedagogical form will be necessary to organize the teaching from?
2. How do you need to organize the learning room?
3. How do you need to organize the learning milieu?
4. What kind of learning resources can build up under your choices?

The term blended learning is in its most common understanding used as the mix of traditional teaching and the use of net based teaching. Gynther claims that the American understanding of the term is very diffuse and argues that it is more fruitful to tie the term to a more concrete didactical method. He also adds that the questions mentioned above are important for the teacher to ask himself when designing a new model of teaching.

Gynther (2005) finds that the term blended learning does not only regard the blend between technological and traditional classroom teaching but also regards the matter of what to learn and what pedagogical method and what kind of technology that promotes learning and different forms of knowledge are used in teaching. It is important to find technological solutions that support different didactical choices. Face to face communication is, today, just one of several ways to organize teaching and learning. The author describes how the future educational market puts the different educational institutions under new types of pressure due to new types of education, subjects and a new type of students. The new type of students demands a flexible educational design where new user profiles are in focus. This also has consequences for learning design.

The result is that blended learning is not one learning paradigm by itself but rather a delivery mode to be used within other pedagogical models. In this regard it would probably be sounder to introduce blended learning rather as a mode within pedagogy.

Approaches to Blended Learning:

Since blended learning is mostly understood as a way of blending face-to-face and technology-based teaching and it is further described as one approach to be used within other pedagogical approaches, it would be interesting to look at different kinds of approaches to blend face-to-face and technology-based teaching. Hiltz and Murray (2005) find that face-to-face courses skilfully blended with online learning technologies and methodologies generally are rated by students as significant improvements over traditional face-to-face classes but that the pace of this change depends upon different social factors.

Bersin (2004) offers two concrete approaches and finds that the goal of blended learning is to synthesize face-to-face and technology-based teaching into an integrated mix. In this way teaching can be tailored based on actual needs. First of all technology can complement traditional instructor-led programs and secondly it can complement technology-based training where the socialization process is lacking and where the students lack motivation and excitement from the instructor. From this thought Bersin finds two general approaches to blended learning:

1. The "program flow" model: a step-by-step curriculum that integrates several media into a chronological program or syllabus. The chapters build upon each other. It ends in an exercise or assessment to measure total learning. This model is comparable to a college or high-school course.
2. The "core-and-spoke" model: One fundamental training approach (onsite classroom training or web-based courseware) with other materials, interactivities, resources and assessments as "supporting materials, optional or mandatory materials that surround and complement the primary approach.

The first approach creates both a deep level of commitment and a high completion rate. Because of this students will feel more engaged and can plan their training over time. Bersin claims that this approach also lets the students find time to fit training into their existing schedules and at the same time it forces them to continue until the conclusion. The approach enables the teachers to track the progress and therefore also find any potential problems. Bersin finds that this approach fits well into classroom teaching. This fits into most instructional design paradigms (learn/try/assess). It serves well for a certification program and it is easy to modify and maintain.

The second approach presented by Bersin is designed with a single course using a single media (electronic or live) employing other media or learning activities as optional or supplementary material. The students decide for themselves which supplementary material to use and they do not need to complete the course at the same time. This approach assumes the students are motivated independent learners. This model speeds up the development process because the training organization can build the surrounding materials over time.

As mentioned in the beginning of the report, Valiathan (2002) introduces another approach in which he divides the approach into three: skill-driven learning, which combines self-paced learning with instructor or facilitator support to develop specific knowledge and skills, attitude-driven learning, which mixes various events and delivery media to develop specific behaviours and competency-driven learning, which blends performance support tools with knowledge management resources and mentoring to develop workplace competencies. Petra Neumeier (2005) has studied language learning in the course of designing, writing and implementing CALL-supported materials. She finds that course designers need a framework of parameters that help them decide on the individual, context-related implementation of blended learning. In order to achieve a better understanding of the factors that shape the practice and the experience of blended learning she introduces several parameters to form a blended learning environment.

Gynther (2005) mentions the increasing demand for better and less expensive education. This has for many been connected with the use of information technology because of the possibility of new and more effective learning outcomes. But the learning outcomes and the possible advantages of the use of technology must be studied in the same broad way as traditional teaching and learning

When starting with blended learning there are some aspects to consider:

1. What advantages does face-to-face teaching have?
2. What problems are known due to communication in virtual rooms?
3. What aspects should the teacher prioritize in face-to-face teaching and what can be put to the net based teaching?
4. How to prioritise between different media and forms of media based teaching?

The most important thing is to be aware of the problems and to consider things in advance. Each medium has advantages and disadvantages, in the sense that it can both support and narrow communication for those taking part in the given teaching/learning situation.

When choosing a blended learning approach to be implemented in teaching, the following things should be considered according to Gynther:

1. Do the media give the student a possibility to observe the teacher's communication?
2. Do the media give the teacher a possibility to observe the student's communication?
3. Do the media give the student a possibility to observe the other students' expressed understandings of the study?
4. Do the media give the student a possibility to observe their own expressed understandings of the study?
5. Do the media offer the possibility of differentiating in the choice of information and in choice of ways to communicate?
6. Do the media give the teacher the possibility of organizing the communication between teachers/students? In groups and project work?
7. How does the use of different media and communication form together in the learning milieu?

The author finds that blended learning gives teachers different ways of transferring information to the students. In this way the student will develop a greater ability to understand the information and blended learning provides new forms for communication and new didactical possibilities, and students with different qualifications can develop a broader ability to learn the information.

There are different approaches of introducing blended learning into teaching. Some of them are outlined in this chapter.. Since blended learning is mostly understood as a way of blending face-to-face and technology-based teaching, the main approach is how to get the two modes into one integrated mix. Regardless of the structure in the models, the approaches build on the integration of one or several media. It is based on self-paced learning with instructor or facilitator support. It has the choice between chronologically-based or random-based syllabus often ending in an either optional or mandatory assessment to measure total learning. The major aspect when finding the right approach is considering the possibilities, advantages, aspects and the different prioritising in face-to-face teaching vs. technology-based teaching.

Summary

The main result of this investigation into the term of blended learning is based on the articles by Oliver and Trigwell (2005), Whitelock & Jelfs (2003) and several others shows that the concept and understanding of the term blended learning is not a homogeneous field within learning theory.

The result is that blended learning is not one learning paradigm by itself but rather one mode to be used within other pedagogical models, showing blended learning rather as a mode within pedagogy.

There are different approaches in introducing blended learning into teaching. In this deliverable some of them have been outlined. Since blended learning mostly is understood as a way of blending face-to-face and technology-based teaching, the main approach is how to get the two delivery modes into one. Regardless of the structure in the models, it has been found that the approaches build on the integration of one or several media. It is based on self-paced learning with instructor or facilitator support. It has the choice between chronology-based or random-based syllabus often ending in an either optional or mandatory assessment to measure total learning. The major aspect when finding the right approach is considering the possibilities, advantages, aspects and the different prioritising in face-to-face teaching vs. technology-based teaching.

The major finding of the literature review is that blended learning is difficult to conceptualise as one particular concept. There are several understandings of the field and consequently many different aspects are investigated.

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Examples of strategies on how 'Blended Learning' can be integrated within traditional European universities

Introduction

This report will investigate strategies on how blended learning can be integrated within traditional European universities. The deliverable will outline examples from other projects that have integrated blended learning within traditional universities. First there is an introduction to the use of the term of blended learning before giving examples on strategies in teacher training, language education, strategies in health education, in social sciences and humanities and finally examples on strategies in engineering and natural science education.

'Blended Learning' - a short introduction

The term blended learning is in its most common understanding used as a mix of traditional teaching and the use of net based teaching. Whitelock & Jelfs (2003) opened a journal special issue on blended learning where they introduced three definitions of the term:

1. the integrated combination of traditional learning with web-based online approaches
2. the combination of media and tools employed in an e-learning environment; and
3. the combination of a number of pedagogical approaches, irrespective of learning technology use.

Of these, the first is the most common interpretation according to Singh (2003 in Oliver & Trigwell 2005).

If blended learning is going to be a used method in an educational institution, the Danish theorist Gynther (2005) points the fact that the term blended learning should put four different didactical questions in focus:

1. What kind of knowledge should the students get and what kind of pedagogical form will be necessary to organize the teaching from?
2. How do you need to organize the learning room?
3. How do you need to organize the learning milieu?
4. What kind of learning resources can build up under your choices?

The author finds these questions essential for the teacher to consider while designing a new mode of teaching.

Bersin, (2004) on the other hand, finds the biggest problem with instructor-led training to be the lack of scale. If you need to teach thousands of students, as is often done at a university, providing one-to-one teaching and hands-on experience is nearly impossible. Another problem is the timescale. The way, these problems are often solved in institutions, is to introduce technology into instruction. Bersin believes that blended learning in this sense can extend the instructor model in space and time. In this way blended learning could be provide education to a larger number of students. Blended learning is not only a method of reducing faculty time or re-focusing student time but also a way to admit more students to an academic program (Cottrell and Robison 2003).

This interpretation of blended learning could have a large impact on the social structure. Not only more students are able to get into higher education but as Aspden and Helm (2004) also mention, the presence of a virtual learning environment (VLE) in an on- -campus setting can alter the dimensions of existing learning and teaching relationships. More students will then not necessarily be the same as there is less contact with teachers and the staff. Research literature indicates that increased engagement with

educational technology can have the effect of drawing staff and students closer together (both physically and virtually) rather than encouraging campus-based institutions to deliver more of their provision at a distance. On-campus students can benefit from appropriate use of technology in ways that make them feel increasingly connected with their institution and their peers. Technology can help to bridge the physical gap between the students, their institution and their peers – even where the actual interactions between students take place offline – and the combination of physical and virtual learning environments can be used to create an effective learning and teaching experience.

Other authors claim that blended learning is not a new phenomenon. What is new is the sheer range of possible components in a blend. The basic factor within blended learning is to decide through selected criteria how these components should be blended. This is the only way to produce fruitful blends. The focus must always be the learning outcome together with learners, learning culture, learning resources, electronic infrastructure, scalability and maintainability in designing, developing and delivering different types of blends. Increasing choice is not an end in itself (Clark 2005).

Many of the books within the field of blended learning have a "how-to-do" approach. Most of these books are written for trainers within companies (see: Bersin 2004, Thorne 2003 and McGinnis 2005). Their main audience is companies and their main focus is on how companies can make training more efficient, less cost and time demanding. Blended learning is portrayed as a new phenomenon that solves nearly all training problems. These books address the reader in a very informal non-academic style with phrases like 'How can it help?' 'Is it right for your organisation?' 'How can you implement it?' and they propagate blended learning as a training method to be used in organisations.

It is difficult to find this kind of "how-to-do" solutions in more traditional academic literature. The academic literature is based on projects where blended learning has been put under investigation. The main goal for these projects is to find out whether the introduction of blended media has an impact on the learning outcomes (see: Taradi et al. 2005, Bjarno 2005, Neumeier et al. 2005, Voogt et al. 2004 and Concannon et al. 2005, Burgon and Williams 2003, Motteram 2006). In the following part, there will be an introduction to some of these academic research projects given.

Examples on strategies in teacher education

The educational law (UFD 1998) in Norway establishes that all pupils at all levels shall be provided with adapted learning. Bjarno (2005) describes how national research shows that teacher training students do not know how to integrate ICT as a constructive tool into the disciplines. Not ICT skills are needed, but, first of all, some good examples of how to use ICT as an integrated part of different disciplines. When The Ministry of Education and Science in Norway developed a new National Curriculum for Degree Program in Teacher Education in 2003 the Department of IT at Oslo University College regarded this as an opportunity of reorganizing ICT teaching and supervision in teacher education. The entire faculty supported the initiative, and started to plan a project aimed at developing multi-disciplinary didactics with ICT to reduce the gap between the lack of practice in teacher education and the needs in primary and secondary schools. In order to realize this the IT department used the concept of blended learning to arrange for the adaptation of learning.

Bjarnø (ibid) examined the combination of using blended learning for students preparing to integrate ICT as a tool for supporting learning processes when being a teacher to close the gap between the teachers' ICT knowledge and their ability to use it for enhancing the learning process. Could ICT as a part of the lectures in the other disciplines be a way to prepare students for their work as teachers? Integrating ICT in all disciplines seemed to be a good solution to achieve the goal. The students had ICT skills but needed

examples on how to integrate it in their teaching. In order to realize this goal, the ICT Department started to help lecturers at the college to integrate ICT in their different disciplines instead of focusing on separate ICT courses. By incorporating the didactical use of ICT in the learning process, teacher training students were given a useful tool for further learning. The students used the teaching material in several ways, but mainly:

1. As a web-based teaching material – online
2. Get physical lectures (up to 350 students)
3. Get supervision connected to assignments in computer suites (up to 30 students)

Lectures were given on selected themes and consisted of a web-based teaching material with assignments. It also involved links to different media such as video-explanations, animations, pictures and soundtracks, connected to supervision in computer suites. The method required a computer suite equipped with a video-projector and one computer per student.

The results showed that there was a continuous need for a didactical dialogue between the Department of IT and the other lecturers in order to achieve successful ICT integration. Integration of ICT into all the disciplines showed that the focus was moving away from scheduled lectures towards new educational forms based on supervision, which allowed teachers to spend more quality time with each student.

One of the basic challenges for the implementation of the project at the University was the infrastructure. All the lectures had to get new computers installed with the same software as the students and the number of computers and video-projectors in the classrooms had to be increased. The findings of the project showed that there was an increase of 21% of students answering that ICT lessons and supervision were useful for the learning process compared to the year before the integration of ICT. Bjarno finds that the challenge is to move from delivering separate ICT courses to developing multi-disciplinary teaching material with ICT.

Not only teacher training students need to learn how to use technology in their teaching. Voogt et al. (2004) also report on how teachers lack skills of integrating technology into their instructional processes. The potential of technology in the classroom is hardly realized and the teachers' learning of classroom use of technology is considered important. Voogt et al. (ibid) look at "blended" in-service arrangement to support secondary school teachers in the integration of technology into their classrooms. The arrangement consisted of workshops, exemplary curriculum materials and computer mediated communication. This blended approach to teacher professional development showed that it seemed to be a promising arrangement for supporting the integration of technology into education.

For teacher training students practice may be one of the most important parts of their education. In another example Motteram (2006) looks at the role of blended learning in teacher education at a Master's program at Manchester University. The findings from this project also show how important the blended nature is for the students to get a balanced program that upgrade skills and knowledge and also enable them to reflect on past and future practice.

In another university teacher training course for prospective teachers of English the students had mini-practice, which implemented micro teaching in a classroom setting, as a part of the blended learning method. The learning concept was based on theories of situated learning in multimedia-enhanced learning environments where the activities included classroom recordings and multimedia-based case stories and electronic interview with an expert who was an experienced grammar school teacher. The practice offered guided insights into analyzing teaching materials, hands-on experience with lesson planning and the experience of acting as

a teacher in an authentic teaching context.

Case studies used as a didactic tool in teacher education were supposed to contribute to a closer and more reflective relationship between theory-driven and practice-oriented aspects of teacher education. The multimedia-based case studies were hypertexts designed as essential components of computer-based learning modules that supported various ways and styles of learning. Students worked with the case study material either in guided or in self-regulated scenarios several times during the course. It has been found that there are three types of learners: students who mainly create and apply experiences, students who mainly study theoretical resources, and students who create experience by focusing on a selection of resources (Kupetz and Ziegenmeyer 2005).

Examples on strategies in language education

Language learning should not only activate the teacher but also the students in a way that makes them learn. It is not only important for the language teacher to learn to use technology in their teaching but may also be fruitful for students taking part in a language course. In this perspective, both teachers and students need systems designed in such ways that will enhance learning. Petra Neumeier (2005) looks at language learning in the course of designing, writing and implementing CALL-supported materials. She finds that course designers need a framework of parameters that help them decide on the individual, context-related implementation of blended learning. In order to achieve a better understanding of the factors that shape the practice and the experience of blended learning she has found several parameters to form a blended learning environment. The main parameters have been derived from and influenced by the research and development project JoblineLMU at Munich University:

Parameter Individual descriptors

1. Mode • Focus on mode	• Distribution of modes • Choice of modes
2. Model of integration • Sequencing individual modes	• Level of integration
3. Distribution of learning content and objectives and setting aims	• Parallel or isolated
4. Language teaching methods	• Use of teaching methods in each of the modes employed
5. Involvement of learning subjects	• Interactional patterns: individual vs. (students, tutors and teachers) collaborative language learning activity • Variety of teacher and learner roles • Level of autonomy
6. Location	• Classroom, home, outdoors, computer room, institutional settings

The parameters describe and conceptualize a blended learning environment for language learning and teaching purposes (Neumeier 2005:167).

The author finds that if the parameters are applied successfully, the idea of blended learning could serve as a bridge between the broader community of language teachers, learners, CALL experts and practitioners.

Another project involving language learning was the introduction of a web-based learning program of English for Academic Purposes (EAP) for British students from ethnic minority backgrounds described by Harker and Koutsantoni (2005). The students participated in two different modes of learning during the 9-week long program - blended learning and distance learning. The authors find that the blended learning mode is much more effective in student retention, whilst student achievement levels are similar in both groups. In addition, formative and summative feedbacks from the students suggest that most students in both groups are satisfied with this web-based EAP program.

Examples of strategies in health education

Ellis et al. (2006) report a phenomenographic investigation into students' experiences of learning through discussion both online and face-to-face. The study context was a second-year undergraduate course in psychology for social work in which the teacher designed discussion tasks to begin in face-to-face mode and to continue online. A combination of open-ended questionnaires and semi-structured interviews was used to investigate students' conceptions of what they were learning, what their intentions and their approaches were to learning through discussion.

The analysis of the interviews and open-ended questionnaire data has identified a number of qualitatively different conceptions, intentions and approaches to learning through discussion. Associations have been found between what students thought they were learning through discussions their approaches to learning through discussion and their course grade. The authors have found that students with a cohesive conception and students adopting a deep approach got better course grades. Furthermore, the findings show that there is no significant difference between deep and surface approaches to face-to-face discussion and course grades.

Davies et al. (2005) examined BSc Physiotherapy students' experience of developing their neurological observational and analytical skills using a blend of traditional classroom activities and computer-based materials at the University of Birmingham. New teaching and learning resources were developed and supported in the School of Health Sciences using Web Course Tools combined with a wide range of video clips of patients with neurological disorders on CD-ROM. These resources provided students with the opportunity to observe "real patients" prior to clinical placements, thus bridging the gap between their theoretical understanding of these disorders and their practical experience of evaluating abnormal movement in the clinical setting.

Another example for the health sector is given by Guldberg and Pilkington (2006). They analysed a sample of online discussions to evaluate the development of adult learners as reflective practitioners within a networked learning community. Their analysis demonstrate that students belong to an overarching community of practice with different subsets, like these students being parents and carers of people with autistic spectrum disorder (ASD), worked together at sharing and co-constructing common understandings. The shared discourse and common notions of what constituted good practice helped to create a safe interaction space for the students. Once group identity was consolidated, more challenging questions emerged and the group was able to define further common values, understandings and goals through processes of resolution.

Examples of strategies in social sciences and humanities education

Both in the social sciences and the humanities producing texts is a major part of education. Learning by producing text has been done by the use of technology like computers for a long time. Several text shaping programs have been introduced over the last few years. Cox et al. (2004) evaluated the educational effectiveness of online chats at a Humanities postgraduate course and in the final year of a Commerce course. The authors have found that the roles of blended course design, group dynamics, and facilitation style in

the use of online collaboration within face-to-face courses facilitate more inclusive learning conversations than what is possible with exclusively face-to-face interaction.

Webb et al. (2005) suggest that it is the model of learning and its fit with supporting technologies, rather than the presence of technology per se, which enhances learning outcomes. The authors looked at four distinct semester-long treatments, which varied the mixes of classroom and online discussion. This was used to teach a graduate Management Information Systems (MIS) survey course. Their findings suggest that by using Web technology, college instructors may offer students the option of participating in high-quality courses using the case method pedagogy in an online environment. Furthermore, the findings show that the students not only appear to do as well as in the traditional classroom, but that students in the online environment may perform better at multiple levels of learning outcomes, especially when using a blend of classroom and online technologies. Furthermore, the precepts of the case method pedagogy may be enhanced by the use of online discussions. The authors suggest that instructors employing the technique may find their own importance devalued, while the time demands of the approach can be much greater than for traditional classes.

Examples of strategies in engineering and natural science education

In engineering and natural sciences education the use of technology may be much more common than in many other disciplines. Still Derntl and Motschnig-Pitrik (2005) find that there has been little attention in research paid to integrating technology to improve the learning process in terms of depth and scope. The experiences and evaluations of one major academic course on Web Engineering indicates that blended learning adds value only when facilitated by educators with high interpersonal skills, and accompanied by reliable, and easy-to-use technology.

In 2002, the teaching of radiological anatomy to first-year medical students was changed from group learning (20-30 students with a preceptor and films at a view box) to a blended learning model that included a brief didactic introduction followed by small group (7-8 students) web-based structured learning modules with rotating lab instructors. In 2003, the modules were changed to include self-study cases prior to the lab, follow-up cases, and twice-weekly optional review sessions. The findings show that integration of computers as didactic instruction with small and large student groups is well-accepted by students and make the students conform to accept theories (Shaffer and Small 2004).

Summary

The current report shows that there are several ways to integrate blended learning within traditional universities. Blended learning is not a new approach within university teaching and learning. What is new is the sheer range of possible components in a blend. The institutions must decide, through selected criteria, how these components should be blended to produce fruitful blends. A blended course must constantly determine the balance between face-to-face and technological components in using blended learning as a didactical method. This calls for educational designers to be sensitive.

Blended learning is not only to blend different media. In designing, developing and delivering different types of blends - component, integrated, collaborative or expansive – the learning outcome must be in focus. This cannot be investigated without a look at the learners, the learning culture, the learning resources, the electronic infrastructure, the scalability and the maintainability of the proposed solution.

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Academic research and projects related to 'Blended Learning'

Introduction

The term blended learning is used in several research projects. In these projects and articles, blended learning is defined in several ways and the approach to the term also differs from project to project. Gynther (2005) argues that blended learning was first used in American literature. The term should grasp the blend of traditional teaching and technology based teaching using a wide variety of pedagogical methods and different forms of technology.

The projects mentioned in this deliverable are projects using blended learning as a term in the research described. Though using the equivalent term the main focus in the projects differs and they are therefore put into four categories. First, looking at projects where the integration of technology into teaching has been one of – or the main goal, secondly, looking at projects where perceptions of blended learning, the experience and the results of communication and social relationship are the main focus. Thirdly, there will be a look at the effects on the didactics in traditional teaching and fourth, at the organizational changes based on blended learning. There are several research projects where the approach of blended learning has been the main focus, but the deliverable will only mention a selection of them. In the Appendix to this deliverable there is a list of other projects dealing with this approach.

Academic research and projects related to the integration of technology and technology standards

Many projects focus on how technology can be integrated into different subjects. Though the use of technology and online teaching are not new, it has become more common within the academic settings recently. Kennedy (2005) points out that during the period of growth, there was time for the development of standards to ensure its quality. Yet the standards that have emerged tend to be derivatives of the standards for conventional, classroom teaching. They do not adequately address the specific demands of online education. Kennedy studied how nurse educators could generate credible standards for their online practice and identified flaws in the current guidance for online teachers. Knowledge of standard setting in the health service could be a way of supporting standard setting in higher education. The author has also found that the most useful guidance for the online teacher did not come from the education sector but from the industrial sector, specifically from the IT industry. Nurse educators at the University of Paisley used these findings to develop standards for their online teaching practice.

Though online teaching is not a new phenomenon, standards like this could make the integration easier. Christensen (2003) has found in the study of an introductory course in instructional design at Brigham Young University (Utah) that the balance of face to face and online components is important if blended learning should be successful. Standards could ease this process also for teachers in their work. Voogt et al. (2004) applied and evaluated the blended approach to teachers' professional development in two studies. The authors have found that many studies report on the implementation of technology in education as a complex innovation. Particularly teachers lack the skills to integrate technology into their instructional processes and the potentials of technology in the classrooms are therefore hardly realized. Voogt et al. (ibid) studied a "blended" arrangement consisting of workshops, exemplary curriculum materials and computer mediated communication to support secondary school teachers in the integration of technology into their classroom. The results of both studies show that this blend seems as a promising arrangement for supporting the integration of technology into education. However, realizing the potential of technology to create communities of practice remains difficult because, for most teachers, the use of technology is not yet congruent with their daily routines.

Another project gasps this lack of technology as a part of teachers' daily routine. Not ICT skills are needed, but, first of all, some good examples of how to use ICT as an integrated part of different disciplines. Bjarno (2005) has found that integrating ICT into all disciplines seemed to be a good solution to achieve the goal. The students had ICT skills but needed examples on how to integrate

it in their teaching. In order to realize this the ICT Department started to help lecturers at the college to integrate ICT into their different disciplines instead of focusing on separate ICT courses. The findings of the project show that there was an increase of 21% of student answering that ICT lessons and supervision were useful for the learning process compared to the year before the integration of ICT. Bjarno has found that the challenge was to move form delivering separate ICT courses to developing multi-disciplinary teaching materials with ICT.

A further project was carried out by Motteram (2006) who illustrates how important the blend is for the teachers to get a balanced program that upgrades skills and knowledge as well as it enables them to reflect on past and future practice. The author rests his findings on the study about blended learning in teacher education at a Master's program at Manchester University. The experience helped them to make use of educational technology in the language classroom.

The above mentioned projects illustrate how blended learning serves as a method for people, who use technology in their daily routines, to become familiar with technology as a tool in other subjects. Blended learning becomes a vehicle through which a new subject is learnt at the same time with learning the technology itself.

Academic research and projects related to perceptions and social relationship

The integration of technology within teaching institutions has also very much to do with expectations and perceptions. This is another approach to be found in different projects dealing with blended learning. One of those is given by Rogers et al. (2003) and examines the development of a class at Brigham Young University (Utah) that blends distance and face-to-face students in a synchronous class. The study focuses on how a blended learning environment was experienced by the distance and face-to-face students, as well as by the instructor. While another study done by Ruiz et al. (2006) claims that e-learning allows learners to tailor their experience in order to meet their personal learning objectives. The study is based on a diverse medical education context and the authors have found that students did not experience e-learning as replacing traditional instructor-led training but as a complement to it, forming part of a blended-learning strategy. The authors see innovations in e-learning technologies as pointing toward a revolution in education, allowing learning to be individualized as a more adaptive learning method. It enhances learners' interactions with others in a more collaborative learning context, and transforms the role of the teacher.

This social aspect is also what Aspden and Helm (2004) have found in a study of virtual learning environments (VLE) in an on-campus setting. They have found that the use of VLEs could alter the dimensions of existing learning and teaching relationships. The authors mention that research literature indicates that increased engagement with educational technology can have the effect of drawing staff and students closer together, both physically and virtually, rather than encouraging campus-based institutions to deliver more of their provision at a distance. The authors explain how on-campus students can benefit from appropriate use of technology in ways that make them feel increasingly connected to their institution and their peers. Using qualitative data they have explored how effective use of technology could help to bridge the physical gap between the students, their institution and their peers, even where the actual interactions between students take place offline – and how the combination of physical and virtual learning environments could be used to create an effective learning and teaching experience. The question of how social communication and communities of practice can enhance learning is also examined by Motteram (2006) when studying the role of blended learning in teacher education at the Master's program at Manchester University. Communities of practice were one way of capturing students' experience by using a number of online tools. The experience was particularly relevant and helped them to make use of educational technology in the language classroom.

Another project focusing on the positive learning effect of interaction and student communication was carried out by Guldberg and Pilkington (2006). By means of analysing a sample of online discussions the authors studied the development of adult learners as reflective practitioners within a networked learning community. Their analysis demonstrates that students belong to an overarching community of practice with different subsets, like these students being parents and carers of people with autistic spectrum disorder (ASD), worked together at sharing and co-constructing common understandings. This shared discourse and common notions of what constituted good practice helped to create a safe interaction space for the students. Once group identity was consolidated, more challenging questions emerged and the group was able to define further common values, understandings and goals through processes of resolution.

As a contradiction to the findings of Aspden and Helm (2004) as well as those of Guldberg and Pilkington (2006), Welker and Berardino (2005) have found, from a study of students at the State University of New York Institute of Technology, reduced social interaction along with confusion and more work are disadvantages for a blended learning course. The results of study are not entirely negative as students also mentioned flexibility, convenience, and independence as advantages together with a net economic gain for students as tuition and financial aid remain unchanged while expenditure in time and travel were reduced.

The question of how student communities and social communication can enhance learning has been a field within learning theory for years. The focus on technology within this is studied within the CSCL field (computer supported collaborative learning).

Academic research and projects related to didactics and learning strategies

The didactical aspect is of course always an issue whenever teaching is an issue. The blended learning method will have an impact on didactical solutions and student learning strategies. Taradi et al. (2005) looked at a project in providing educational services for an undergraduate second-year elective course in acid-base physiology. A rich, student-centred educational Web-environment designed to support PBL was created by using Web Course Tools courseware. The course is designed to require students to work in small collaborative groups using problem solving activities to develop topic understanding. The aim of the study is to identify the impact of blended WBL-PBL-collaborative learning environment on student learning outcomes. The students' test scores and satisfaction survey results from a blended WBL-PBL-based test group were compared with a control group whose instructional opportunities meant a traditional in-class PBL model. WBL students scored significantly better on the final acid-base physiology examination and expressed a positive attitude to the new learning environment in the satisfaction survey. Expressed in terms of a difference effect, the mean of the treated group (WBL) is at the 76th percentile of the untreated (face-to-face) group, which stands for a medium effect size. Thus, student progress in the blended WBL-PBL collaborative environment was positively affected by the use of technology

Romano et al. (2005) indicates how growth in distance education increases the need to examine students' learning strategies in distance and blended learning environments. The authors measured and compared students' cramming or spaced-review behaviours across delivery formats as well as examined relation to course achievement and attitudes across a term. Although theory would predict that spaced study rather than last minute cramming would yield higher achievement, researchers report mixed findings in both areas. One hundred fifty-seven students in distance and blended course formats were blocked into 5 groups based on their cramming/spaced-review patterns a week prior to each of 3 post-tests. Significant differences were observed in cramming/spaced review behaviours between delivery formats and for achievement and attitudes.

Another project looking at learning strategies is Nuckles et al. (2004). They study the use of learning diaries to find out the students' written reflections of their learning experiences and outcomes over the course of university seminars. The writing of the diaries was

'tutored' by a computer program named eHELp. eHELp supports the writing of sophisticated learning diaries through a modelling and scaffolding of the phases of planning, production and revision. In addition, the learning diaries got published, by uploading them onto a cooperation platform, so that the learners could read and discuss their peers' diaries. The authors have found that the main function of such public learning diaries was to enrich traditional university courses with blended learning as additional elaborative, organisational, critical reasoning, and metacognitive activities in order to foster a deeper processing and better retention of the contents to be learnt.

In another project Yeh et al. (2005) aimed to discover the relationship between learning records and the learning effect in a blended e-learning environment through multiple regression analysis. The learning records included the grades for online assignments, reading time, the total number of login times, and the total number of online discussions. The learning effect was defined as the total grade for two monthly exams and one final exam. To collect learning record data, an e-learning system was designed that integrated the data collection functionality of learning activities with a teaching material managing module so that the learning records of all the learners were recorded automatically. With this system, an experiment was conducted on a program design course in a local high school. The results differed from those obtained in a 'pure' e-learning setting, and the online homework performance was the only item that significantly accounted for the learning effect, which is a natural result of learning procedural knowledge

Gynther (2005) notes that most of the institutions offering net-based teaching in Denmark provide this in the form of practise communities and informal networks. At Holbaek College of Education a project was carried out in cooperation with the students to develop, test and implement some didactical principles: 'What kind of knowledge should the students get and what kind of pedagogical form will be necessary to organize the teaching from?', 'How do you need to organize the learning room?', 'How do you need to organize the learning milieu?', 'What kind of learning resources can build up under your choices?'. The student group was formed of people that normally would not have the possibility to take a face-to-face course. Gynther has found that the students were very positive to the flexibility that they had in the course. The virtual conferences were used as a storing and distribution channel. The grades from the exam showed that the results were better than those of the students in the traditional course. Gynther has also found that in order to get the students involved there were some specific processes that had to be present; Processes of participation; Processes of "meaning something"; Processes of mutual engagement; Processes of a mutual goal; Processes of knowledge sharing.

Academic research and projects related to organizational aspects in learning

The blended aspect will also have an organisational effect as well as a didactical. As long as learning is a part of an institution, the methods used for teaching will also have an organisational effect. Boeker and Klar (2006) have found that didactical and organizational aspects determine the success e-learning offers as well as influence the general development of e-learning more than technical features do. They explain how e-learning has been established in education and training of physicians in various types: linear, sequential and hyper-textual forms of multimedia presentations and texts, tutorial systems and simulations. Case-based e-learning systems are of special importance in medicine because they allow for mediation of process and practical knowledge by presentation of authentic medical cases in a simulated environment. The integration into medical education and advanced professional training is crucial for the long-term success of e-learning. In case-based systems this can be accomplished by blended learning approaches which combine elements of traditional teaching with e-learning. Learning management systems (LMS) support integration of traditional teaching and e-learning by serving as an organizational platform for the content of teaching. Furthermore, they provide means of communication for trainers and trainees, authoring tools, interactive components, course management and a role-based sharing concept. The authors have found that the dissemination of e-learning can be fostered by paying attention to requirements and user analysis, early adoption to organizational structures, curricular integration and continuous cooperation with students.

Another organisational effect and maybe a major treat for organisations to implement technology within the institution may be the possibility to get more students enrolled and concurrently reduce time spent by the personnel of the organisation. Cottrell and Robison (2003) describe a large enrolment accounting course at Brigham Young University (Utah). The case study focuses on the possibility of using blended approaches to reduce faculty time, re-focus student time, and raise the possibility of using blended learning as a way to admit more students to an academic program.

As mentioned above, Welker and Berardino (2005) studied the outcome of blended learning at the State University of New York Institute of Technology. Responses from faculty revealed enrolment as a major factor in the increased use of this course design; quality of assignments and course grades that are as good or better; and courses that produce improved writing and discussions. Course management technology and course design recommendations were provided for faculty consideration. The findings show that while the design was easy to use, the faculty reported more work on their part and some loss of traditional classroom dynamics.

Blended solutions may also have an organizational effect on students' location and may also solve the time/space dimension. The emergence of cross-cultural classrooms has been steadily increasing in Australian tertiary institutions, due to the growing population of international students enrolling to complete their degrees. Research has suggested that students from different cultures have varying compatibility with different learning environments. Lanham and Zhou (2003) explain how the increase in numbers of international students has signified a change in the student demographics, and the recognition of the differences in students' learning styles. Because of this a more flexible approach for learner content delivery is needed. The authors suggest that in order to ensure that all students are able to participate in this domain; preparations are needed to accommodate all cultural types.

Summary

The field of blended learning is diverse in its nature and it investigates several different aspects of the learning process and the learning environments. This deliverable has reviewed blended learning from four different angles: first, projects in which the integration of technology into teaching has been one of the main goals, secondly, projects in which the experience of learning has been the main focus, thirdly, didactical consequences and finally, in which organisational changes as a result of blended learning has been the main issue. Different findings are reported based on which of the four above mentioned aspects is emphasised.

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Examples of 'Blended Learning' used in commercial practice

Introduction

The most common understanding of blended learning is the integrated combination of traditional learning with web-based online approaches. Also the understanding of blended learning as the combination of media and tools employed in an e-learning environment is often in use while other authors interpret it as the combination of a number of pedagogical approaches, irrespective of learning technology in use (Whitelock & Jelfs 2003). This deliverable will introduce blended learning models from a few authors interested in the commercial practice of blended learning. Secondly, it will give some examples of the introduction of blended learning into industry.

Models in commercial practice

While many authors use blended learning as a tool to investigate the use within learning, other authors are interested in the actual use of blended learning within industry and commercial practice. These authors see blended learning as the integrated combination of traditional learning with web-based online delivery modes. Thorne (2003) as mentioned in deliverable 2.1 and 2.2 write books based on an audience interested in implementing blended learning as a training method within the company and industry sector. Thorne sees blended learning as a way of making learning more individualised and refers to the theorist, Howard Gardner, on how people respond positively to different learning stimuli. In this way, organisations and schools can give people different ways of working, based on multiple intelligences.

As Thorne (ibid) sees it, one of the real advantages of blended learning is the opportunity to be more focused and specific about the learning need. Blended learning provides the opportunity of tailoring learning to the individual rather than applying a one size fits all approach. From this, he puts up a list of seven points to help identify the basic needs:

1. Establishing the level of demand/timescale. The very nature of the blend builds in flexibility.
2. Recognizing different learning styles. Asking the question of how students do things differently takes into consideration different learning style preferred.
3. Looking creatively at the potential of using different forms of learning, i.e. matching the learning need to different delivery methods and identifying the best fit. The integration of blended learning represents an opportunity to take what exists and evolve it into a different dimension using new technologies - by presenting the learner with a wide range of options.
4. Working with the current providers, internal and external, to identity the learning objectives and to ensure that the provision meets the current need. (For a university this should already have been done. For a new subject this should be done)
5. Undertaking an educational process and developing a user-friendly demonstration to illustrate the potential of blended learning
6. Being prepared to offer follow-up coaching support
7. Setting up a monitoring process to evaluate the effectiveness of the delivery (Thorne 2003: 36ff).

Furthermore, Thorne sees several benefits based on what type of medium the content is available in:

- The class is not kept waiting while the trainers help a few delegates to catch up on basic knowledge
- Delegates have the chance to cover the basic material at their own pace.
- Reference to the intranet / internet several times for extra support
- Dissemination to a wider audience

- A lager body of training materials can be made available to users
- If people miss a day, they can catch up using multimedia packages
- Saving time and travel costs
- The ability to make geographically dispersed virtual teams
- The lessons and the activities can be studied prior the one-to-one sessions or the classroom activities freeing time for more practical activities in the classroom.
- Creating individual courses supplementing classroom tuition and examinations
- Cost-cutting because of saved time in tutoring
- Learning can be more targeted, focused, just-in-time to the learner
- Learners can interact with tutors, fellow students. (Thorne 2003).

Another writer within this tradition is Bersin (2004). He points out that since the advent of computers in the 1960s` organizations have been trying to apply technology in the learning and training process. He finds that the first technology-based training approach came with mainframe and mini-computers in the 60s and 70s and mentions a pioneering system of such named Plato, a system developed in 1963 by Control Data at the University of Illinois. Plato pioneered the use of computers in traditional educational settings and still exists today. Bersin puts up two general approaches to blended learning:

1. *The "program flow" model: a step-by-step curriculum that integrates several media into a chronological program or syllabus. Like taking a college or high-school course. The chapters are building on each other. It ends in an exercise or assessment to measure total learning.*

The "program flow" model creates a deep level of commitment and a high completion rate. Learners feel engaged and can plan their training over time. It gives learners the time to fit training into their existing schedules but forces them to continue until the conclusion. It enables the teachers to track the progress and if people drop out or miss steps, it will be possible to know precisely where they have a problem. It fits into the normal flow classroom training that most people expect. Many learners are used to learning in this way through their academic careers over semesters and years. This is also the model most existing contents use, and it fits into most instructional design paradigms (learn/try/assess). It serves well for a certification program and it is easy to modify and maintain.

2. *The "core-and-spoke" model: One fundamental training approach (onsite classroom training or web-based courseware) with other materials, interactivities, resources and assessments as "supporting materials, optional or mandatory materials that surround and complement the primary approach.*

In the "core-and-spoke" model approach, the program is designed with a single course using a single media (electronic or live) and uses other media or learning activities as optional or supplementary materials. The main difference between the core-and-spoke approach and the program flow model is that the supplementary materials are optional and not explicitly scheduled. The students decide which supplementary material to use and the students do not necessarily complete the course at the same time. Using reference material is an easy way to build a core-and-spoke model. In general, is it easier to build in stages in this approach. If you build the core curricula, you can launch it immediately and add the supplementary materials over time. But this approach assumes you have a motivated independent learner. The core-and-spoke model speeds the development process because the training organization can design the surrounding materials over time. The spoke material can be made more important with exercises and events and be specialized for special needs. The core-and-spoke model is effective when learners are motivated, experienced, and already experts. It gives them the choice of media and resources to succeed.

How is one going to choose the right blended model? Bersin lists eight criteria for selecting the blended learning model:

Program type: driven by business needs like costs. If the problem is a training issue and not a management issue and has an impact on the management.
Cultural goals: create relationships, linkage and shared values.
Audience: size, education level technology competence access, motivation to learn, personal motivation, time.
Budget: development.
Resources: time, money and persons. Time to launch and complete the program and the content.
Learning content: complexity and interactivity.
Technology: standards, plug-ins, bandwidth, display, security.
What effects program cost: Total audience size.
Media selection: In-house vs. outsourced.

Furthermore, the following model in blending different teaching media is suggested:

Model	**Defining Feature**
e-learning self-study with other blended media or event	A self-study course as the central learning program. The learner accesses multiple media elements surrounding an online core-and-spoke course
Instructor-led program blended with self-study e-learning	e-learning used as prerequisites, activities during the class and between classes
Live e-learning centred with other media added	Webinars, e-learning events, self-study
On-the –job training	On the job training with a instructor
Simulation and lab-centred	IT and application training where an entire environment can be simulated

(Bersin 2004: 85)

The model may work for blending traditional teaching and technology in both traditional universities and in workplaces. He also lists four examples of types of corporate training:

Type 1: Information Broadcast:
Typical e-Learning or training Interactivities: Read, listen, watch
Typical Blended Media: Conference call, webinar, e-mail or newsletter

Type 2: Critical skills transfer
Typical e-Learning or training Interactivities: Read, listen, watch and ask and answer questions
Typical Blended Media: PowerPoint-based courseware, live e-learning webinar, track completion but not scores

Type 3: Skills and Competencies
Typical e-Learning or training Interactivities: Read, listen, interact, practice, ask questions, interact with others, take an examination get feedback
Typical Blended Media: Web-based courseware, instructor-led class, conference call, onsite labs, simulations

Type 4: Certification (as represented or meeting a standard)
Typical e-Learning or training Interactivities: Read, listen, interact, practice, answer questions, take an examination, get feedback, pass or fail
Typical Blended Media: Web-based courseware, instructor-led class, conference call, onsite labs, simulations, external or internal testing, tracking by LMS for completion and expiration date.

Another main thing in doing blended learning in a program is how much tracking and reporting is necessary. Tracking refers to the technology and the processes to measure the enrolments, activity, completion, scores, certifications and satisfaction of the program. The business requirements determine which level of tracking and reporting is needed in the company. Practise has shown that people will not complete more than one or two hours of self-study per week unless this is explicitly allocated in their work schedule. Bersin's suggestions are that when you know the business problem - have an idea of the program strategy and an appropriate budget - you should design and develop the program. You have to find the right media for your problem, audience and budget (Bersin 2004).

Other authors offering blended learning models for companies are Semler (2001) and Troha (2002). Semler (ibid) finds that blending online learning methods with classroom training makes training sessions shorter and allows your learners to take the training wherever they go. He suggests some relatively simple techniques to help you convert courses into blended delivery. There are three overall objectives to this activity: 1) increase learning impact, 2) increase learner satisfaction and ease of use, and 3) reduce the total cost of training. By focusing the classroom portion of the course on skill practice and application, learning impact can be increased. Learners are also allowed to explore and work with the content wherever it makes sense for them. By offering portions of a course as online self-study, the length of face to face training sessions and the associated delivery and travel costs can be reduced. Troha (ibid) provides a model intended to guide you and your team through the process of blended learning design. By virtue of its checks and balances, a successful outcome is virtually assured. Accompanying the model there is a list of sections for an instructional design document, which, as it is developed and fine-tuned, provides a vital discussion document and focal point for all parties involved in the project. The list contains the following items: Course Title, Purpose Statement, Audience Description, Duration, Prerequisites, Learning Objectives, Constraints, Content / Learning Activities Outline, Transfer of Learning Strategy and Evaluation Strategy Content Sourcing.

Some of these books give examples on how blended learning is incorporated in different companies. In the following there will be an introduction of some of these examples.

Examples from industry training

Blended learning is a well-spread model in the US commercial setting, but is less exemplified in the European area. Research confirms that technology has low use today in most organisations' leadership-development programs. Evidence points to growing use, but the researchers do not expect quick and dramatic change, because rapidly changing technology does not necessarily imply accelerating adoption unless the culture is conducive to technology use. But a number of driving forces are likely to boost the adoption of technology in leadership-development programs such as:

1. Leadership portals
2. Simulations for interactive, experiential learning - often in blended formats and
3. Rich media content.

The authors claim that as technology becomes more user-friendly and easier to use, technology will find new applications in leadership development (Trondsen 2006).

Brennan (2004) claims that online delivery of training (i.e., e-learning) has surpassed the early-adopter stage, and companies find that the longer they use it, the more they use it. A cost-cutting slant has been effective in fostering its growth as a tool at the disposal of training professionals. However, training and development professionals should recognize that cost savings will not perpetuate themselves and should focus their energies on increasing the value of their services to the corporate mission by efficiently and effectively delivering content that supports both organizational and individual goals.

There has been a rapid growth in trade union involvement with ICT to support both vocational learning/workforce development and trade union education. Most European confederations and many individual unions now have some level of involvement with technology and learning, and we can start to learn from each others' approaches and experiences.

Six case studies were conducted between June and October 2004 along with an online survey. There were five national case studies from Italy (Confederazione Italiana Sindicati Lavoratori), Germany (Deutscher Gewerkschaftsbund (DGB) Bildungswerk), the Netherlands (Federatie Nederlandse Vakbewegingen), Sweden (Landsorganisationen i Sverige) and the British (Trades Union Congress) and one transnational case study from the European Trade Union College (ETUCO). These cases illustrate some of the diverse ways in which trade unions are approaching the use of ICT to support formal and informal learning, vocational and trade union training, blended learning, organisational and self-paced learning; and national and transnational learning. The case studies reveal a range of approaches towards the use of ICT in trade union learning which reflects a variety of organisational priorities and responses in particular national contexts. Differing industrial relations environments, union cultures, national government policies and initial experiences with ICT in learning are among the factors contributing to this diversity (Creanor and Walker 2005).

Bersin (2004) comes with an example from General Motors. This company relies heavily on video-based instruction to train dealers. The aviation Industry CBT Committee developed the most useful and widely implemented approach to enrolment, tracking, reporting, and book-marking electronic content. AICC standards were built into almost every course and every LMS available in the marketplace today. Today SCORM (Sharable content object reference model) a superset of AICC, is slowly becoming the new standard for content packaging and interoperability. SCORM builds on AICC and adds concepts such as reusability, sequencing, and searchable metadata.

A European alternative to the SCORM model is the IMS-LD model (Learning Design) researched and developed by the Dutch Valkenburg group. The model introduces standardised ways to describe learning activities both within the man-computer context and also in the face-to-face one, which has been one of the short comings of SCORM. Providing tools and techniques to lay out blended learning activities such as instructor based learning, e-learning and collaborative approaches online and in face-to-face meetings is the strength of the IMS-LD model. This makes the IMS-LD approach viable for blending learning technologies and methods (Koper and Tattersall 2005).

When a large global oil company decided to redesign their entry-level engineering training on petroleum practices, they realized that socialization was critical to the success of the program. Their blended program, which was months in duration, used online and face-to-face activities in a structured mix. The program included self-study, web-based modules, classroom instruction, synchronous online chat and online assessments. They were located all over the world but met each other in a training facility near the end of the program where they could face-to-face reinforce the cultural community they had created online. When incorporating blended learning for a study program, it was necessary to ask how important it was to develop a sense of culture and social experience in the program (Bersin 2004:43f).

Another company dealing with distribution for industry products wanted to find a new way to get busy telephone sales representatives to take online courses on a new version of a SAP system. Last online course turned out to be disaster since people was too busy to take the training. This was a problem since the company wanted people to be completely proficient before the new system went live. Not only were people too busy to take the training but there was no time during the software rollout to let people practice. The company decided to focus on cultural factors and created a blended program. They started with a series of conference calls and local meetings held by regional coordinators. The coordinator brought people together and created a local "social context" for the training. By adding socialization and local presence the learning results turned out to be three to four times higher than those of the previous e-learning program(Bersin 2004:44f).

As described below Bersin introduces the "program flow" model and the "core-and-spoke" model. In this section Bersin shows examples on where the different models are in use:

The "program flow" model:

Ex.1
Roche Pharmaceuticals made a program for learning their SAP order processing system. One of the lessons learned from these programs is that process training is just as important as application training. The company had to go back and develop a face-to-face module, which included whiteboard pictures and diagrams, to explain the business process from a functional perspective. It was after this took place that the blended learning model started to work.

Ex. 2
The company BT had a new product to launch and wanted to start a training course but found that their employees would use too much time to cover all the topics. They therefore decided to start a blended learning project starting with a hosted conference call before they had a two-hour e-learning program, an instructor-led check-in conference call to answer questions, a second one-two-hour e-learning program and finally an instructor-led one-day event with real world practice. In his way they managed to shorten down the time previously allocated.

Ex.3
A major U.S. bank had each year 2,400 new employees to train. Before the blended learning program was introduced, the company used the course that took six weeks to be completed. The goal of the new program was to shorten it down to four weeks. The team in charge of the blended learning program developed a series of web-based training courses with different scenarios, simulations, role plays, group discussions and briefing sessions with the manager. The program took nearly twelve months to develop but had excellent results and facilitators reported that learners reported being on the same level of mastering as reported after five weeks in the prior instructor-led program.

Ex.4
In 2001, CAN Insurance needed to roll out an entirely new performance planning process to more then 2,000 managers before the end of the year. E-learning efforts in the past were disappointing due to low enrolment and lack of interest. The new approach was blended learning. The company implemented an innovative web-based platform that enabled learners to enter the blended environment online. On this environment each student were members of a cadre, which is a team of fifteen to thirty people who work through the program in the same schedule, score each other's exercise and interact throughout the program. In addition they had an online coach that served as a tutor, advisor and teaching assistant. Through the platform a high-impact blended learning was made and the learner satisfaction and business impact went up dramatically (Bersin 2004: 36ff).

The "core-and-spoke" model:

Ex.1
In a semiconductor manufacturing engineer training program, the blended learning program combines online component with hands-on lab sessions. By doing this, nine in-class days was reduced to two ten-hour self-paced online courses followed by two eight-hour lab sessions and a short instructor-led event to reinforce information, practice and answer question they had.

Ex.2
A large retailer with 650 stores around the US found that online learning was not enough to learn modules concerning topics like" how to sell HDTV", "understanding stereo components", etc. The result was a core-and-spoke program where they introduced a checklist where the learners had to walk through the store, identify items and perform tasks. By this simple approach the company improved their e-learning investment.

Ex.3
Rolls-Royce PLC
Since 2000, Rolls-Royce plc has been faced with training requirements to support a large Enterprise Resource Planning implementation, involving major changes to company processes and the introduction of SAP as the IT system to support the processes. Based on best experience they changed the model for training from computer-based training as a prerequisite to instructor –led training to online learning where the instructor led training reinforced the online lessons and used the face-to-face element as a vehicle for communication in change and introduced the online learning lessons so delegates are prepared for online learning – post-workshop.

Summary

This deliverable introduces blended learning models from a few authors interested in the commercial practice of blended learning. Models on how to blend materials and instructional methods are described, and also criteria for selecting between them. Examples from the industry sector are provided and two of the main models for sequencing content are described: the "program-flow" and "Core and spoke". Further, examples are given of successful implementations of both models, also explaining the reasoning behind the decision of which model to use.

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‘Blended Learning’ Cases

Introduction

‘BLENDED LEARNING’ CASES

The aim of this part of the handbook is to introduce several examples on how the Blended Learning approach is used in higher education in different countries. The cases are actual courses, modules and programs, where Blended Learning has successfully been integrated into the ordinary traditional curriculum. The cases cover examples not only from technological sciences, but also from humanities, educational and social sciences and life sciences.

The 14 case descriptions provide basic information about the topic, pedagogical aspects, use of technology, blending methods and evaluation of the outcomes for each case. There is also a link to additional information and contact details. Some of the cases are also described in more detailed way in the EPPS.

SELECTION OF CASES

The selection process for cases has been based on the “best practice” principle, so that each partner country has sent good examples of how traditional university courses and ICT have been integrated into higher education. As it can be seen in the theoretical part of this handbook, the definition of blended learning is not clear, and the practice is even more complex and multidimensional. was and the practice is even more complex and multidimensional. Therefore, a more flexible and open approach was adopted in the case hunting, so that no strict rules and narrow definitions were used when defining what blended learning was and what something else was. The basic single characteristic common to all cases is that they all introduce a university level course or training module, where traditional face-to-face teaching, seminars and lectures are somehow integrated into the use of information and communication

technologies (ICT).

There were two obvious problems when hunting for the cases. First of all, blended learning is not a term commonly used in higher education settings, and in many places university teachers and professor actually use BL without knowing it. There is also a long history of distance education, especially at Open Universities, and even though DE is not the same as BL, the borderline between these modes of delivery is vague. Secondly, because BL is more or less a business life related term, universities are not really forerunners in blended learning applications, and therefore many of the innovations and good models which have been available in other fields of education for several years, have not yet reached the higher education.

OPEN MIND

The main purpose of these case studies is to encourage individual teachers, professors and faculties to experiment with ICT in an innovative way, so that also higher education organisations can benefit from the obvious advantages the new technology provides for teaching and learning. The first step can be as simple as adding an e-mail discussion list to traditional series of lectures, so that there will be more interaction between the lecturer and the students, as well as between the students. An ultimate, totally blended innovation could be for example a course where video conferencing, wikis, digital camera, mobile phones etc. are used to facilitate face-to-face research seminars where the students can be present either in person or virtually. Technology exists, and is also often already available at many universities, and at low cost (if not free).

The only obstacle – or excuse – for not using the modern learning technologies is usually the lack of imagination which is often disguised as lack of time, or lack of skills. The latter can often be easily corrected by asking help and support from the university learning technology unit (yes, there must be one at your university as well). And in the long run, a successful blending will give the teacher more time to focus on relevant parts of the teaching processes.

LIST OF CONTENTS

Blended Learning Cases

‘Blended Learning’ Cases
Best practices showcase

Data Analysis II (Finland)

Name of the case:
Data Analysis II

University, department & country:
University of Helsinki, Faculty of Social Sciences, Department of Mathematics and Statistics, Finland

Study context (level of studies, topic):
Undergraduate; applied statistics

Target group:
Undergraduate second/third year students in Social or Behavioural sciences

Description:
The aim of the data analysis methodology course is to learn how to (1) analyse empirical data and to formulate, estimate and evaluate statistical models as data analysis tools, and (2) present research problems and results clearly using graphical methods and other statistical presentation tools. Course requirements include 60 hours small group instruction, part of which is lectures and guided practical exercises on computers. Students also prepare presentations of their exercises and write a report on the course assignment. The course gives 10 ECTS.

Pedagogical approach:
The course is mainly based on constructive learning approach, more closely on cognitive constructivism. Detailed planning of teaching and learning activities is emphasised (Biggs 2003), and the active construction of information is the main process. Teacher's role can be defined as a pedagogical guide. Teaching is based on discussions and on questions raised by the students, on active solving of exercises, on shared workspace and on "traces" the students leave/present when they work on their exercises. The basic idea is to learn from others' solutions and presentations, and to share the learning process.

Use of technology:
Course website and BSCW – learning environment. All course materials are available on the website, including the students' presentations and exercises, discussion groups.

Blending method:
BSCW is integrated into the course very closely; main teaching method is still small group "lectures" which are based on discussions and questions, but BSCW include all materials, including data and presentations for student presentations. Therefore, the web is usually used as part of the f-t-f learning sessions as well (lectures, presentations), not only as an additional or separate tool. The estimated distribution of the use of different methods is: 30% of web based learning, 30% of f-t-f and 30% of individual work.

Outcomes and evaluation results:
The use of web based learning environment has increased the students' collaborative work and sharing of information and ideas. The learning outcomes are better than in the earlier non-blended format. The feedback from the students is good, and the use of the web has also reduced the work load of the teacher (more collective feedback on assignments, management, and change of role from

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Biggs, John (2003). Teaching for Quality Learning at University. 2nd ed., The Society for Research into Higher Education & Open University Press.

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Information management and information systems development (Finland)

Name of the case:
Information management and information systems development

University, department & Country:
University of Jyväskylä, Department of Information Sciences, Finland

Study context (level of studies, topic):
Undergraduate; Information management and information systems development

Target group:
Undergraduate students in Information Sciences

Description:
The themes of the course Information management and information systems development are (1) administrative view to information resources management, (2) technological view to information resources management, (3) building information systems, and (4) organizational applications. The course was inspired by a textbook, Information Technology for Management: Transforming Business in the Digital Economy (Turban et al., 2002). The course usually lasts for seven weeks including lectures (36 hours), coursework (feasibility study) as well as the final exam. The blended course offered in fall 2005 also lasted this length of time and included the above-mentioned activities. In addition, there was material and activities on the WWW to support the lectures. The key idea is the learning of the basic concepts of information systems science by utilizing a problem-based seminar on the web. The idea is that students themselves find all the concepts and issues in the lecture material that they find unclear or not well-defined.

Pedagogical approach:
Constructivist, combining both cognitive and social constructivism as well as problem-based learning.

Use of technology:
Internet search engines, word processors, and the Optima learning environment

Blending method:
Optional problem-based seminar and support materials on the web, parallel to face-to-face lectures. Web-based learning environment (approximately 25%) supports the lectures (15%) and individual study (60%).

Outcomes and evaluation results:
The solution supports learning in various ways in the spirit of both cognitive and social constructivism. First, the students compose a coursework report focusing on the self-defined problems of the subject area. This is carried out by using search engines on the web as well as by publishing the report on the web. Secondly, in the web-based seminar students can familiarize themselves with other students' coursework reports.
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Links to additional information and references:

http://www.cc.jyu.fi/~pmakkone/tjta111/

Biggs, John (2003). Teaching for Quality Learning at University. 2nd ed., The Society for Research into Higher Education & Open University Press.

Contact person (name, email, telephone):

Pekka Makkonen Lecturer
http://www.cc.jyu.fi/~pmakkone/
University of Jyvaskyla FINLAND

Learning theories (Norway)

Name of the case:
Learning theories

University, department & Country:
Stord/Haugesund University College, Department of Teacher Education, Norway

Study context (level of studies, topic):
10 credits of the Master Degree course "ICT in learning"

Target group:
Teachers, teacher training students, developers & tutors of e-learning

Description:
In this module the students learn theories and methods related to the use of digital tools in learning. The central goal is the use and integration of ICT into education

Content:

- Main guidelines related to learning
- Memory
- Meta cognition
- Transfer of learning/knowledge
- Social learning

The different theories shall be related to practical situations and experiences.

Pedagogical approach:
The courses in the study program use:

- Local teaching and tutoring
- Net-based guidance
- Video transmission

Pedagogical approaches:

- Collaborative learning and constructivist learning
- Problem-based learning
- Project-based learning

All theories are related and adapted to teaching and guiding of both on-campus and off-campus students.

Use of technology:
The course is organised for both on-campus and off-campus students. To give an adequate study program to these groups, the study uses the Internet and Learning Management Systems to a great extent. Tasks that are carried out with these tools are:

- Distribution of material
- Broadcast of live and on-demand video
- Teacher-student and student-student interaction
  - Synchronous communication
  - Asynchronous communication
  - Guidance

Cooperation and collaboration

Blending method:
Classroom lecturing is a relatively small part of the course. This is broadcasted as live and on demand videos. Guidance is given related to the location of the students. On campus students are given guidance face-to-face, and off campus students are given guidance through email, learning management systems, synchronous communication like MSN and asynchronous communication like discussion forums. In practice it is seen that the on campus students also use the same tools as the off campus students to a great extent. Communication between students, in a group composed of on campus and off campus students, is also much based on synchronous and asynchronous communication tools.

Outcomes and evaluation results:
40 master students have completed the course, with a very low drop-out rate.
The students have given overall, positive feed-back to the teachers.

Links to additional information and references:
http://stud.hsh.no/lu/inf/master/ (in Norwegian)
http://www.hsh.no/english/ICT_in_Learning.pdf (in English)

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Global Environment and Development Studies – Development Management (Norway)

Name of the case:
Global Environment and Development Studies – Development Management

University, department & Country:
Agder University College, Faculty of Economics and Social Sciences, Institute for development studies, Norway

Study context (level of studies, topic):
Master of Science, Environmental Studies, Topic: Global environment issues

Target group:
African and Norwegian students with a relevant Bachelor degree, academic knowledge of English, interest for sustainable development

Description:
The objective of the study is to familiarize students with theories and findings concerning development, but also to offer managerial tools to practical problems. Solutions to problems are sought from a variety of disciplines, including economics and the functional areas of management, political science, sociology, anthropology, and geography. A wide variety of institutional contexts are considered, including local and international private business, non-government organizations, central and local governments, international and nation al regulatory and donor institutions.
The students meet physically one or two times during the study program period of two years.

Pedagogical approach:
Mainly social constructivist approach

Use of technology:
Internet, Management Learning System, Video, CD-ROM

Blended method:
In the course of the two-year full-time study program, the students, professors and tutors meet twice, over a length of six weeks. In the two first weeks they meet to socialize; to have hands on training in using the LMS and to be guided into the social constructivist pedagogy used in virtual classrooms.

In the second period of four weeks the students, professors and tutors meet in South Africa. The first two weeks they have hands on training in the use of GIS. The rest of the period is used for field training interview techniques and research methods. The rest of the two years is collaborative online study. The so called system of quality assured study sites is used in the program. This means that 3-4 students in each country are offered their own computer rooms with computers and infrastructure at their 'home' campus. The students thus have opportunities to discuss the assignment informally before they enter the virtual classroom on the Internet.

Outcomes and evaluation results:
On completion of the course the participants should have the ability to:

- Present different views relating to the concept of development and current development issues
- Discuss the relationship between governance, aid and globalisation
- Describe and discuss critically problems relating to urban growth, small town development and the impact on rural areas.
- Give an overview of global population trends and discuss whether we have a population problem
- Discuss whether the concept of sustainable development has more relevance for the situation in poor or rich countries

The participant will gain / improve skills in:

- collaborative work online and face-to-face with peers by sharing ideas; analysing problems; negotiate meanings; and finding solutions;

Exam results from the first year: Above average.

Links to additional information and references:
http://www.hia.no/oksam/english/mdevm/index.php3
http://www.gvu.unu.edu/prog.cfm

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ICT in Learning (Norway)

Name of the case:
ICT in Learning (master's programme, 120 cr)

University, department & Country:
Stord/Haugesund University College, Department of Teacher Education, Norway

Study context (level of studies, topic):
Master's Degree Course, integration and application of ICT in learning

Target group:
Teacher training students, teachers and developers of ICT based learning environments

Description:
The central goal of the course is the use and integration of ICT in education. It is not a course in technology and in learning theories as separate disciplines. The study is based on ideas from similar studies for ICT and learning in other countries. It has its roots in teacher education and composes the fourth and fifth year of a five-year complete course leading up to a teacher certificate and a Master's degree in ICT in learning.

Pedagogical approach:
The courses in the study program use:

- Local teaching and tutoring
- Net-based guidance
- Mandatory seminars in which all the students meet physically at the university college (may be arranged as virtual (video) seminars)

Different courses in the master study are based on pedagogical approaches relevant for the course content. Applied theories and models are:

- Collaborative learning and constructivist learning
- Problem-based learning
- Project-based learning

All the theories are related and adapted to teaching and guiding of both on campus and off campus students.

Use of technology:
The course is organised for both on-campus and off-campus students. To give an adequate study program to the groups, the study uses the Internet and a Learning Management System to a great extent. Tasks that are carried out with these tools are:

- Distribution of material
- Broadcast of live and on-demand video
- Teacher-student

- Synchronous communication
- Asynchronous communication
  - Guidance
  - Cooperation and collaboration

Blending method:
Teaching in auditorium or classroom is a relatively small part of the course. This is for some of the courses broadcasted as live and on demand videos.
Guidance is given related to the location of the students. On campus students are given guidance face-to-face - as well as via the Internet, and off campus students are given guidance through email, learning management systems, synchronous communication like MSN and asynchronous communication like discussion forums. In practice it is seen that the on campus students also use the same tools as the off campus students to a great extent.
Communications between students, in a group composed by on campus and off campus students, are also much based on synchronous and asynchronous communication tools.

Outcomes and evaluation results:
20 students have graduated so far, with good results

The results of the online evaluation questionnaires to students at the end of individual courses are generally positive, but the revision of content, methods and technology is required. A revised version of the master program will start in August 2007.

Links to additional information and references:
http://stud.hsh.no/lu/inf/master/ (in Norwegian)
http://www.hsh.no/english/ICT_in_Learning.pdf (in English)

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Internet Publishing (Norway)

Name of the case:
Internet Publishing

University, department & Country:
Sør-Trøndelag University College, Department of Informatics and e-Learning, Norway, teacher: Svend Andreas Horgen

Study context (level of studies, topic):
Preliminary studies in Internet technology, a course teaching HTML and JavaScript, and overview over Internet technologies in general.

Target group:
First year students studying Informatics/Economics

Description:
I have been using e-learning techniques to enhance student activity in class. Instead of using lectures in an auditorium, I have been using a PC-lab. This has enabled switching between theory and practical exercises. I have also been using a LMS system in order to further enhance the blended learning experience. Here is a short list of the activities/outlines used:

- Evaluation forms with questions to be filled in by the students before the theory is taught. Benefit: Student enters learning mode and will likely learn more and be more active during the theory lesson to come
- Theoretical walkthrough, 15-20 minutes
- Multiple choice questions or some other practical exercise, also using the LMS this time.
- Another lesson with theory, 15-20 minutes
- A 20 minutes' long break.
- First, another evaluation asking them to answer with free text some things that were lectured on some minutes before. This provides helpful information for me as a teacher (while the students enjoy their break) to gain information about the students misconceptions or knowledge gaps
- And so on…

I have also tried another interesting thing: Per Borgesen (my colleague) and myself have had a dual-lecture – where we both spoke on different things (alternating) and we felt free to interrupt each other and comment on each other. In this way, the lecture was not so staccato, and it was easier to maintain a dialogue with the students. The downside, of course, is that we both needed to be present. Even through we used twice the time compared to a 1single teacher lecture, the students got extra motivated when we both lectured simultaneously. It should be noted that we only did this exercise in the first and in the last lecture each semester (in this course), so it is not too time exhausting!
I have also tried the use of podcasts – that is: downloading podcasts from IT-news or other relevant material, and then typically:

- playing the podcast for 5-10 minutes
- discussing the podcast in small groups for 5-10 minutes – what this was about and how it is related to the theory.
- Summary from me/the students in plenary for 5-10 minutes.

Pedagogical approach:
Described in detail above.

Use of technology:
LMS-system, PCs for each student, speakers (for podcast-usage)

Blending method:
I think I have already described this above in as much detail as necessary.

Outcomes and evaluation results:
Informal evaluation indicates that the students welcome this form of education. It is also good because those who cannot join the lecture can gain access to all the digital material from the LMS. They only miss the lecture and my “speaking”.

Links to additional information and references:
In Norwegian:
http://www.aitel.hist.no/~svendah/FoU/PPT/horgen-blended-learning-steinkjer-oktober-2006.ppt

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Mathematical Programming (Lithuania)

Name of the case:
Mathematical Programming

University, department & Country:
Vytautas Magnus University, Department of Applied Informatics, Kaunas, Lithuania

Study context (level of studies, topic):
Program of undergraduate studies (fourth year of studies). Mathematical Programming

Target group:
The students of departments of Informatics, Economics, Engineering and Applied Mathematics are meant to be the primary users of the course.

Description:
The course combines theoretical and practical spheres, but is more oriented to practical task solution in purpose so that the student would learn to formulate practical optimization tasks which are based on mathematical terminology, would be able to establish the chosen model's suitability and complexity would be able to choose a suitable algorithm appropriate for practical and mathematical formulated task solution, would be able to understand the optimization's results, would be able to advise others on questions connected with optimization methods and software.
The course deals with classification of problems and solution methods (Gradient method, Conjugate gradient method. Newton method and its modifications. Search methods), convex sets and functions, global optimization. Minimum conditions for the problems with constraints. Penalty and barrier methods for the problems with constraints. Linear programming. Basic solutions. Simplex algorithm. Polynomial complexity methods for linear programming. Multi-criterial optimization.
While designing the course a lot of attention was paid to accumulative experience in science analysis in the optimization sphere teaching of similar disciplines was also used as an example.

Pedagogical approach:
The course was prepared under the strong influence of methodology of Project Based Learning (PBL). While developing the course many similar courses of different universities were analysed and discussed with the colleagues. Required courses in manufacturing systems and simulation build upon these skills and provide engineering design experiences.
Traditional teaching is combined with problem based, project based and discussion based learning.
Students study the theoretical part independently and sometimes attend lectures, they can also take online lessons (there they can find records of the lessons). During the discussions they must discuss the topic suggested by the professor during the lesson or which is uploaded onto the webpage.
All the assignments are compulsory and the deadlines of the projects (it is on the electronic calendar) and assignments can be found on the same webpage. Here is also available the schedule of the lessons and the consultation time with the assistant or the professor.

Use of technology:
1. The instructions of practical work are presented on the WWW home page of the course. Some illustrative materials and

examples of problem solutions, prepared by students, are also available on the home page as well as advanced theoretical material (e.g. lectures by Prof. J.Clausen) and references to software.
2. An electronic dictionary is also available with links for wider information.
3. Discussions forums
4. E-mail for contacting the professor
5. Videoconferencing for online lessons
6. Virtual learning environment (FirstClass)

Blending method:

Blended Learning: combining both - traditional lectures (face-to-face) (15 lessons, each of the lesson takes two hours) and seminars plus distance collaboration with the students (discussions' forums, online questionnaires, videoconference meetings online, students can find all the material in the virtual environment, they also put their projects, laboratory, other homework in the virtual environment under their passwords) (52 hours are given for an individual assignment and the students have 15 lessons in the laboratory class, each of it takes two hours), and they use technologies to communicate and to exchange information, assignments and assessments.

Outcomes and evaluation results:

Links to additional information and references:

Suggested books in electronic format:

1. Antanas Žilinskas, Matematinis programavimas (pdf and html formats, in Lithuanian);
2. Benny Yakir, Nonlinear optimization (pdf format);
3. Jonas Mockus, Global and discrete optimization (html format);
4. Article: "Jens Clausen Teaching Duality in Linear Programming - the Multiplier Approach' (pdf format).

Website for taking and putting information for studies:
http://fcim.vdu.lt/Conferences/F00017C98/F00052D02/?WasRead=1

The dictionary of the main concepts with the links to wider manuals:
http://mathworld.wolfram.com/

Also additional material for the course:

1. Žilinskas A. Matematinis programavimas. VDU, 1999.
2. Bazaraa M., Sherali H., Sheti C., Nonlinear programming. J.Wiley, 1993.
3. Bertsekas D. Nolinear Programming. Athea Scienfic,1995.

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Requirements specification (Lithuania)

Name of the case:
Requirements specification

University, department & Country:
Kaunas University of Technology, Department of Software Engineering, Kaunas, Lithuania

Study context (level of studies, topic):
Study Area of Technological Sciences.
Study module 'Requirements specification' is for Master students who study Software Systems Engineering and it is one of four research modules. Further modules of the program are 'Analysis of Software Systems architecture', 'Information technologies in project management', 'Software implementation investigation'.

Target group:
Master students from the Faculty of Informatics.

Description:
The main attention is paid to requirements analysis and specification (modules 'Software Requirements Analysis' and 'Simulation and Validation of Systems'). In such a way Master students already study methods and tools of the requirement analysis at the beginning of the study program and afterwards they can use the acquired knowledge to form the requirements specification of the objective area under computerization according to the Master thesis. Two courses that generalize software engineering area – 'Software Engineering Process' and 'Software Engineering Management' – are delivered together with the above mentioned courses; these courses are aimed at expanding and deepening knowledge acquired during Bachelor studies. During project development students familiarize with the standards, prepare proposals, plan and requirement specifications of the project.
Main topics are: Software requirements document; Requirements evolution; Problem analysis; System model description; Data modelling; Functional and non-functional requirements; Using of prototypes for requirements specification; Development of software requirements document.

Pedagogical approach:
A combination of theoretical knowledge and practical skills in order that students could design and produce software systems efficiently which fulfil the users' and clients' requirements, teach to evaluate, analyze and simulate software system quality factors in order to ensure a disciplined and controllable development of a software system.
E-learning is widely used during the studies. Studies management information is public and available on the Internet.
The main principle of the study system is the wholeness of science and studies and design skills training, based on the student's systematic and autonomous work. The importance of practical design is especially highlighted. In other words, the main principle is teaching by designing. So, from the viewpoint of pedagogical approach it is project-based and problem-based learning.

Use of technology:
1. Website (http://soften.ktu.lt/~virga/mag_atmintine). Project themes, document templates, examples, standards, requirements for deliverables, schedules, requirements for skills, project and software quality requirements are uploaded there, as well as assignments' deadlines and material needed for the course and preparing the assignments.

2. Information system created by each student individually at the begging of the course, where it is mandatory to store all the required documents and assignments that the student does. Such information management systems are private; they can be accessed only by means of passwords as this is required by the majority project customers.
3. E-mail, seminars are used for the communication with the professor.
4. Master studies' problems are discussed in the online forum http://proin.ktu.lt

Blending method:

Traditional lectures and seminars plus distance collaboration with the students, also usage of technologies to communicate and to exchange information, assignments and assessments.

Outcomes and evaluation results:

The aims of the evaluation are: to recognise those strategies and techniques which proved effective during the course of the project so that their use may be reinforced or expanded; and to identify areas in the process and product that need to be improved in the next project.

The benefit of evaluating a software project is greater understanding of the software project organization, software development organization and people that are involved. This understanding is essential for the ability to perform software process improvements.

After finishing four modules:

- The average grade for the project quality stated by Master project tutors is 9.72;
- Master students evaluated their projects on an average of 8.33;
- The average grade for the Master project tutors' consultations stated by the students is 8.28;
- The average grade for Master project design process arrangement stated by the students is 7.71;
- 43% of students referred the number of Master project deliverables as too large, 57% - as sufficient and no student referred this number as too small.
- The average grade for the Master students' work in the enterprises stated by practice tutors is very high – 9.93;
- Only 76% of students consider the practice as useful for their skills development;
- The practice place corresponded to the Master project topic for 62% of students.

Links to additional information and references:

Methodical material for "Project Management': http://proin.ktu.lt/~kestas/Proj_vald/Kepure.html (in Lithuanian)
Software Engineering Standards: http://soften.ktu.lt/~virga/mag_atmintine/1sem/standartai.htm
Other literature: http://soften.ktu.lt/~virga/mag_atmintine/interneteka.html

Also there are many examples and advice how to do practical works.

Further literature in English:

1. I.Sommerville. Software Engineering. Addison-Wesley, 4,5, 6 editions
2. R.S. Presman and D.Ince. Software Engineering - A Practitioner's Approach. McGraw-Hill, 3, 4,5 editions
3. G.Booch. Object-Oriented Analysis and Design. The Benjamin/ Cummings Publishing Company, Inc., 1994

4. R Pooley and P Stevens. Using UML: Software Engineering with Objects and Components. Addison-Wesley, 1999
5. M.Cotterell, B.Hughes. Software Project Management. International Thompson Computer Press, 1995
6. G.Booch, J.Rumbaugh, I.Jacobson. Unified modeling language user guide. Addison-Wesley, 1998
7. I.Jacobson, G.Booch, J. Rumbaugh. The Unified Software Development Process. Addison-Wesley, 2000
8. J.Martin and J. Odell. Object-Oriented Methods: a Foundation. Second UML Edition. Prentice-Hall, 1998
9. C.Larman. Applying UML and Patterns. Prentice-Hall, 2000

etc.

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Organic chemistry (Estonia)

Name of the case:
Organic chemistry

University, department & Country:
Tallinn University, Department of Natural Science, Estonia

Study context (level of studies, topic):
Bachelor-level introductory course in organic chemistry

Target group:
Second-year students specialising in biology and having chemistry as minor specialisation subject

Description:
The aim of this course is to introduce the basic principles of organic chemistry and give an overview of the most important organic compounds. The practical section introduces the principle techniques used in analysis, purification and synthesis of organic compounds. The knowledge of organic chemistry is required for studies of bioorganic chemistry, biochemistry and environmental chemistry.

Pedagogical approach:
Because of the high level of abstraction of the subject matter it is difficult to implement active learning methods (like discussions, role plays and online collaboration) in this course. This is why the course is mainly based on individual assignments.
As an E-learning environment, the IVA forum is used for discussions about the practicum experiments. The students have an opportunity to compare their results and discuss why some experiments were successful and others were not.
The students must write a written term paper that will be peer-reviewed by the fellow students. Every review must have a different approach.

Use of technology:
Most of the functionalities of IVA LMS are used in the course: blog, discussion forum, individual and group portfolios, quizzes, wikis.
Computers were also necessary for presentations and getting literature.
In order to pass the course successfully, the students had to use the free molecular modelling software,
MDL Isis Draw which was possible to download from e-learning environment IVA.
Text-, video- and software installation files are provided on CD-Rom for each student who does not have fast access to the Internet.
The students had a possibility to ask the instructor for technical help, the IVA user manual was also helpful.

Blending method:
The organic chemistry course is partly Web-based, a significant amount of learning activities takes place in IVA Learning Management System. It is suitable for the students who study at university, but also for people whose work is connected with this subject and they need some extra knowledge. Participation in the course requires knowing a lot of facts and it is also important to have abstract thinking and a good memory.

The course is a combined course, there are one and a half hour lectures (introductory, materials were in learning management environment IVA), three hour seminars (presentations and other students' reviewing) and practicums of 34 hours (in chemistry it is not possible to do chemistry practicums in a Web-based format).
The learning resources are mainly in .pdf format or presentations. A lot of colourful illustrations, schemes, diagrams were used – it makes printing difficult for students. Students receive a CD-Rom with videomaterials.

Outcomes and evaluation results:
The course has been offered twice so far and both times it was quite successful. Last year there were 26 registered students and 24 of them passed. In order to get marks, the students must take two short Web-based tests (10%), one short term paper (10%), and they must prepare a presentation (10%). In addition students must defend their laboratory protocols (15%) and to do a written test about the laboratory protocols (15%) and finally must do a school-based written test (40%). Active learning in the IVA environment might have a good influence on the students' grades.

Links to additional information and references:
http://iva.tlu.ee/IVA
user: DEMO
password: DEMO

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Ethno music (Estonia)

Name of the case:
Ethnomusic

University, department & Country:
Tallinn University, Department of Arts, Chair of Music, Estonia

Study context (level of studies, topic):
Master studies in musical education

Target group:
Students of MA program “Musical education” (joint groups for distance- and on-campus students). Course can be taken (and quite often, is taken) by students of other faculties as an elective course.

Description:
The Ethnomusic course is about the culture of the near-neighbours’ (Latvia’s, Lithuania’s, Ukraine’s, Finland’s, Sweden’s, Norway’s, Asian and American nations’) music, especially folk music and -culture focusing not only on music, but also on the text, images and videos. The rich collection of online digital learning resources is useful for the students, because they are always accessible and can be re-used by learners during their professional practice. The course serves as an example for music teachers, by demonstrating how the ethnomusic topics can be taught in more interactive and reflective ways in primary schools.
The aim is that the students become able to analyse didactical aspects of teaching folk music traditions and then use them in work with children. The students will also know the character of the neighbours’ folklore and can identify the peculiarities of folk music of different nations through the analysis of musical actions. The students can use computer as a learning, communication, authoring and presentation tool.

Pedagogical approach:
Comparative approach to cultural studies is combined with social-constructivist pedagogy.

Use of technology:
Most of the functionalities of the virtual learning environment IVA (except wikis) are used in the course: forums, blogs, access to digital learning materials, submission and grading of assignments. Computers are also necessary for presentations and getting literature.

Blending method:
In individual tasks the students must work through the literature and the material of the lectures. They also must prepare a presentation about one nation’s music (it must be in IVA learning environment or in the form of .ppt /reported speech/ portfolio) and solve some web-based tasks (crosswords and fill-in texts) and participate in discussions. The course ends with two tests. (e.g. in Latvian and Lithuanian music) 75% of the course is web-based and work takes place in IVA learning environment.

Outcomes and evaluation results:
All the 12 students who started the course last year finished the course.
For getting a mark, the students must be present at least 50% of the theoretical classes, practical lessons must be done later in practicum, individual studies must be done, and it is also important to participate in discussions.

Links to additional information and references:
Course was chosen e-course of the year 2004 for using the multi-media (http://www.e-uni.ee/index.php?main=148)
Learning resources are in learning environment IVA (http://iva.htk.tpu.ee)

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Educational Technology (Estonia)

Name of the case:
Educational Technology

University, department & Country:
Tallinn University, Department of Educational Sciences, Estonia

Study context (level of studies, topic):
It is an introductory course about educational technology for Master students.

Target group:
The group consists of at least 10 students, most of them come from Educational Science and Educational Management MA programs. The course has entry requirements: the students must do the introductory computer literature course.

Description:
The course belongs to the domain of didactics, focusing on the aims and methods of information technology in the educational process. The objective of the course is to develop competence in development of digital learning materials and uploading them on the Internet, learning and teaching in a Web-based environment, development of multimedia presentations and Web-pages etc.
The course covers the following theoretical topics: basic concepts in educational technology, computers in Estonian schools – history and present status, ICT in educational policy, didactics of using ICT in learning, an overview of educational technology research carried out in Estonia, ICT and media competency standards in the national curriculum, methods for using computers and the Internet in subjects, integrated learning projects based on ICT.

Pedagogical approach:
The course is based on constructivist approach, students learn by creating (knowledge) artifacts by themselves (both individual and group tasks), but also by reflecting on their experience and reviewing the work of fellow students.

Use of technology:
All face-to-face activities are carried out in a computer lab, each student is provided with a computer. Only open-source software is used for assignments: OpenOffice, Audacity, Wink, Mozilla Composer. Learning Management System IVA is actively in use, most of the discussions and reflections are carried out with the help of blog and wiki tools in IVA environment.

Blending method:
The course is worth 3 credits, and the course has 32 hours of face-to-face activities instead of 48 which would be typical for a normal course. Blending e-learning with traditional forms and methods is performed in two ways on this course: most of the face-to-face activities are carried out in a computer lab in a form of frontal, synchronous e-learning and another important part of the learning activities are carried out in the virtual learning environment IVA.

Outcomes and evaluation results:
Only one student out of 15 did not finish the course last year. In order to get a grade, it was required to write an essay (15% of grade), to complete the final quiz (15%), to prepare an ICT strategy for the student's own school (30%), to plan an integrated e-learning

project, to develop a set of digital learning resources, to make a presentation of a personal e-portfolio (20%). Students, who did not prepare and present their e-portfolios, were not able to get a higher grade than D. Portfolio development was important because it was not done only for one course, students were supposed to keep developing it further during their school practice and so the facilitator could have an opportunity to see what the students do, what they learn, when the course is over.

Links to additional information and references:
http://iva.tlu.ee/IVA
user DEMO
password DEMO

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Project planning and management (Estonia)

Name of the case:
Project planning and management

University, department & Country:
Tallinn University, Department of Social Science, Estonia

Study context (level of studies, topic):
The course is designed for MA studies in public administration, but it has been very popular also among the students of other faculties, as project management has become one of the most popular minor subject at the university.

Target group:
The course is mostly meant for Master-students, but usually Bachelor students can join the course as well. The secondary (and quite large) target group consists of the clients of the Open University, who can just take this course for their professional development purposes. The course can be (and have been) provided also by some companies in the form of internal training for their employees.
The group is large, the last group consisted of 50 distance students and 75 on-campus students. There were 15 students in the pilot course.

Description:
The course provides an overview of the specific topics of project work, participants gain practical experience in planning and managing projects by implementing the methods of project work and compiling a project plan. The aim of the course is to develop the students' skills to independently prepare, plan and implement projects, and thereby to improve their competitiveness in the labour market.
Covered topics: The concept of project, types and history. The structure of project organisation. The phases, inputs and outputs of a project. Identification phase: problem analysis, development ideas. Preliminary study: market-research, risk analyses, swot-matrix. Formulation of project objectives. Project proposal, competition. Planning phase and compiling the plan: developing the activity schedule, the budget, planning the human resources and the quality management system. Planning communication, information and co-ordination systems, leaderships strategy and management tactics. Implementation phase. Evaluation phase: analysis, evaluation, compiling the final report. Project management software.
Time management is the main focus of the course. The students must create GANTT and Pert diagrams using MS Project.

Pedagogical approach:
The course is heavily based on collaborative learning. LMS IVA enables to evaluate group work assignments and individual contributions. Group tasks are not important only for collaborative knowledge building purposes, but because of the nature of project work in general – projects are almost always collaborative and that is why, the practical experience of collaborative working is important. Feedback shows that this course offered the only possibility for the students to do collaborative assignments during their studies because most of the (e-learning) courses rely on individual work.
The groups consist of 4-6 students and they use group portfolios in IVA LMS. They have a shared folder for presenting their assignments for the teacher to evaluate. Wikis, text memos and upload files in IVA are used by the students.

Informal group communication, that others cannot see, takes place through emails or MSN conversations or in IVA forum. Unfortunately, there is no chat room in IVA.

Use of technology:
Most of the face-to-face activities are carried out in a computer lab, learners are expected to use computers at home in order to contribute to online collaboration of their project group using IVA LMS.
There is an evaluation copy of the project management software to download from IVA LMS, the students must use it for their assignments.
Online collection of digital learning resources contains mainly diagrams and examples created by MS Project software. The interactive tutorial of MS Project software is also available.

Blending method:
There are five contact days during a semester, it is obligatory for every student to participate in at least three contact days. Every student must read the online textbook of project management and also one book chosen by herself/himself.

Outcomes and evaluation results:
All the collaborative and individual assignments are presented publicly, so the students can learn from each-other (benchmarking method). Once-twice the students were supposed to evaluate other groups' work, using the evaluation sheets of European Commission, which gives them evaluating experience and is good for writing the project proposal.
As the course has a practical value, there are no tests. Also in IVA, participating in the forum is not evaluated. 70% of the grade is ready project plan. 5% of the grade is homework and group work and about 20% of the grade is activity. Theoretical knowledge is checked in an oral presentation of the project plan. Almost all registered students have passed the course with good results

Links to additional information and references:
http://iva.htk.tlu.ee/organizer_index
user AastaKursus05
password AastaKursus05

Contact person (name, email, telephone):
Sigrid Salla
sigrid.salla@tlu.ee

Study Aids in Vocational Education (Estonia)

Name of the case:
Study Aids in Vocational Education

University, department & Country:
Tallinn University, Educational Sciences Department, Estonia

Study context (level of studies, topic):
Aim of the course is to provide an overview of teaching aids and their role in the process of study. It is a main course for Bachelor students.

Target group:
The target group of this course is the second-year Bachelor students in vocational pedagogy. Actually, the course is provided separately for two different target groups: for the regular BA students and for the distance education students. The latter group usually consists of experienced vocational education teachers who need a teacher's qualification. The number of students depends on the student intake and drop-out, but usually the average group size is about 25-30 students. The course is compulsory for all the BA students specialising in vocational pedagogy. The students from other faculties and departments can choose this course as well, but until now it has not happened.

Description:
The course addresses the following topics: types of teaching aids, their purpose and didactic requirements. Storage and development of technical teaching aids. The data projector and the presentation software. Portfolio assessment. Compiling and solving problem tasks and situations. Videotaping and its classroom uses. Using video camera for recording and analysing the learning activities. Assessment criteria and instruments. Intellectual property rights for study aids, open courseware initiatives and licenses. Computer-based quizzes and self-tests, their underlying principles, didactic requirements and standardisation.

Pedagogical approach:
Although there is no clearly defined pedagogical approach for the course, the course setup and the activities follow the pattern similar to experiential learning – the students are expected to experiment with different tools and tasks, then to reflect on their actions.

Use of technology:
During the course, mainly open source and free software is used:

- Acrobat Reader
- HotPotatoes
- Audacity
- eFormular
- Web-based learning environment IVA

Blending method:
About 50% of time spent by the students on learning activities is allocated for distance learning activities in virtual learning environment IVA. About 25% of the study time is spent on face-to-face activities, which are equally distributed between lectures,

individual and collaborative tasks in a computer lab.

Outcomes and evaluation results:

The completion rate of the course has always been high; most of the students become deeply engaged in learning activities. As some of the students have said, they were very pleased with the course, because they had the possibility to learn to use the software and technical equipment which are difficult to learn on their own. Students also mentioned the possibility of having contact with the lecturer that made it easier to do the course.

Links to additional information and references:

http://www.tlu.ee/~heidi/HotPot
http://www.tlu.ee/~heidi/Audacity

Contact person (name, email, telephone):

Heidi Paju
heidi.paju@tlu.ee

Physics of Dynamical Systems - (Portugal)

Name of the case:
Physics of Dynamical Systems.

University, department & Country:
University of Porto, Faculty of Engineering, Portugal.

Study context (level of studies, topic):
Undergraduate; physics, mathematics.

Target group:
This is a main course for undergraduate students of second-year informatics and computing engineering.

Description:
Study of dynamical systems. Non-linear dynamics, oscillations, chaos and fractals. Learn how to use a Computer Algebra System (CAS).
Number of students: 120
Number of teachers: 2 Jaime Villate and João Carvalho
Number of tutors (+tutors tasks during the course delivery): 0

- Second-year students in Informatics and Computing Engineering
- 2 lectures and a 2-hour practical session per week
- Contemporary physics topics: non-linear dynamics, chaos and fractals.
- Hands-on approach using Personal Computers
- Learning Management System (LMS): Moodle
- Computer Algebra System (CAS): Maxima

Pedagogical approach:
Active learning with hands-on tutorial sessions in a computer lab.
The Web interface with the Moodle LMS is the course page. It contains some menus and blocks. The content and activities specific for the course are arranged by sections into the main content block.

Use of technology:
LMS Moodle, in particular usage of

- Forums,
- Chat,
- assignments,
- quizzes,
- glossaries

and CAS software (Computer Algebra System Maxima) to support lecture parallel activities and hands-on sessions in computer lab.

Blending method:
Twelve weekly hands-on sessions are held in rooms with 12 computers, with 2 students working on each computer. The students will find the summary and proposed problems for each session in a section of the Moodle course page. They will use Maxima to solve the proposed problems, and by the end of the session they will submit their results in Moodle.
Teachers will find the files sent by each group of two students, and will enter some comments which are then e-mailed to the students and archived in the Moodle server where the students can find them later on.

Outcomes and evaluation results:
Grades improved considerably, with respect to the traditional course on Classical Mechanics (on 2001/02), the number of enrolled students that did not attend the course (Absent) decreased from 34% to 14%, the number of students who passed increased from 43% to 94% and the number of students who attended the course but failed decreased from 47% to 13%.
The number of enrolled students who decided to attend the course also increased significantly, reflecting a better motivation of the students.
The development of the blended-learning components for this course was awarded by the University of Porto with the first edition of the E-Learning Excellence Award.

Links to additional information and references:
Course website (LMS Moodle):
http://moodle.fe.up.pt/2005/course/view.php?id=12

Course website (Information System SiFEUP):
http://www.fe.up.pt/si/Disciplinas_geral.FormView?P_ANO_LECTIVO=2005/2006&P_CAD_CODIGO=EIC2107&P_PERIODO=1S

Articles and other references:
http://fisica.fe.up.pt/pub/villate/b-learn/b-learn_villate.pdf
http://www.fe.up.pt/si_uk/PUBLS_PESQUISA.FORMVIEW?p_id=11634&p_tipo=Relat

Course literature:
J. E. Villate, Introdução aos Sistemas Dinâmicos, edição do autor, 2005. ISBN: 972-99396-0-8

Contact person (name, email, telephone):
Jaime Villate
villate@fe.up.pt
http://www.villate.org/ or http://www.fe.up.pt/si/funcionarios_geral.FormView?P_CODIGO=211847

Long case descriptions

COURSE DESCRIPTION

Name of the course:
Internet Publishing

University, Department, Country:
Sør-Trøndelag University College, Department of Informatics and e-Learning, Norway, teacher: Svend Andreas Horgen

No of ECTS:
(Norwegian study points = ECTS)

Language:
Norwegian

Area of science:
Informatics

Level of studies:
introductory, bachelor first year.

Course type:
lecture + laboratory

Course description:
Preliminary studies in Internet technology, a course teaching HTML and JavaScript, and overview over Internet technologies in general.

Course literature:
lesson, internet resources (optional use of book: Sams teach yourself HTML in 24 hours)

Additional materials:
multiple choice tests, exercises

Course website:
https://www.itslearning.com/ site: Høgskolen i Sør-Trøndelag.
User: svendhorg
Password: Blearn123
Course name: Publisering på Internett 07V.

Number of students:
30

Number of teachers:
2
Number of tutors:
0

PEDAGOGY

Learning objectives:
Be able to make Internet Pages, and understand basic underlying technologies.

Pedagogical approach:
Mostly individual learning, traditional teaching and practical exercises. The blended learning approach means some elements of collaborative learning, but traditionally this course has been a “teacher holds a 2 hour lecture, and you as a student solve a programmatic exercise (with assistance available if needed)”. My new variation, is now a 3-3,5 hour lecture with strong involvement of student activities, using blended learning as described in this document.

Innovative elements:
Use of podcast, blended learning (LMS real-time) to increase student activity, and motivation, and some lectures with dual-teaching (two teachers collaborating “on stage”, holding the lecture together.

Main pedagogical references:
N/A

TECNOLOGY

Use of technology:
LMS (it´s learning)

Description of how technology is used:
described later. Speakers to enable the students to listen to podcasts, and every student needs a PC available.

Justification of technology use:

Innovative elements:
Enhances learning since the digital resources opens new possibilities for me as a teacher to communicate with students. It is easier to ask a (good) question if you can think for 1 minute, then to write it down in an LMS survey, and submit to the teacher, which immediately can answer the questions. I think this is innovative, and does not necessarily create a distance between students and student-teacher. Podcast usage is also innovative, but if I read loud from some webbased article, it could yield the same effect. However, it is important that the students can get to know the many good news-sources (especially podcasts) out there. It will maybe inspire them to listen to quality podcasts on the bus, instead of just music

BLENDING METHOD

Detailed description:

I have been using e-learning techniques to enhance student activity in class. Instead of using lectures in an auditorium, I have been using a PC-lab. This has enabled switching between theory and practical exercises.
I also used an LMS-system in order to further enhance the blended learning experience. Here is a short list of one of the activities/ outlines I have been using:

- Evaluation forms where the student should answer questions before the theory was presented. Benefit: Student enters learning mode and is likely to learn more and be more active during the teory lesson to come
- Theoretical walkthrough, 15-20 minutes
- Multiple choice questions or some other practical exercise, aslo using the LMS this time.
- Another lesson with theory, 15-20 minutes
- Then there will be a 20 minutes long break.
- First, another evaluation asking them to answer in free text some topics that have been lectured some minutes ago. This provides helpful information for me as a teacher (while the students enjoy their break) to gain information about students misconceptions or knowledge gaps
- And so on...

I have also tried another interesting thing: Per Borgesen (my colleague) and I have had a dual-lecture – where we both speak alternating, and we feel free to interrupt each other and comment on each other. In this way, the lecture is not so staccato, and it is easier to maintain a dialogue with the students. The downside, of course, is that we both need to be present. Even tough we use twice the time compared to a 1-teacher lecture, the students are extra motivated when we both lecture simultaneously. It should be noted that we do this exercise only the first and last lecture in each semester (in this course), so it is not too time consuming!

I have also tried the use of podcasts – that is: downloading podcasts from IT-news or other relevant material, and then typically:

- 5-10 minutes playing the podcast
- 5-10 minutes discussing the podcast in small groups – what was this about and how is it related to the theory?
- 5-10 minutes summary from me/the students in plenary.

Please also describe,...
1. How is the Content presented. If possible, estimate also the proportions in percentages.
☒ Face to face lectures .....%
☒ PowerPoint presentations .....%
☒ Electronic materials in web, LMS, full text or slides.....%
☐ Video streaming, archived video lectures, video conferences.....%
☐ Audio streaming, archived audio lectures.....%
☐ Animations.....%
☒ Graphs, illustrative figures and images.....%
☐ Integrated solutions (slides in combination with audio or video) .....%
☐ CDs, DVDs.....%
☒ more: Podcast content, multiple choice tests

2. Which of the following sections of the course are managed web-based:
☒ Communication
☐ Group Study
☐ Study guide presentation
☒ Content presentation
☒ Feedback, technical support, course assistance
☒ Administrative information (contacts, requirements, expected learning results, etc)
☒ Assignments
☐ Assessment
☐ Tests
☒ Self-tests
☒ Self-evaluation
☐ Additional materials

DESCRIPTION OF STUDY PROCESS

Please list the learning activities (methods) and their order/arrangement during the course delivery:
Please describe 2-3 main learning activities in detail. *Suggested frame for learning activity (method) description*

I have already described this in the "detailed introduction" box, but can add the following picture to illustrate:

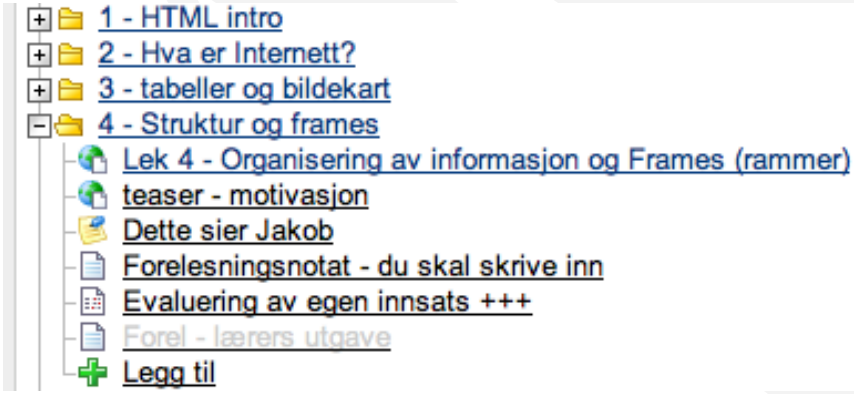

Figure: A typical "blended session" lesson. First the students get to read a large text (some days in advance) and then they get a teaser – motivation for the theory of today. This is a link to a web-article of relevance. A note, "Dette sier Jakob" also has some text (here: Jakob Nielsen's views on a study that indicates that people use 50 ms to evaluate a new web-page). After that, a Powerpoint can be downloaded. In the Powerpoint, some information is stripped. I as a teacher open the (inactive) last element (bottom). It is a Powerpoint with all information. Hence – students can fill in the missing information. During the Powerpoint show, I as a teacher also come up with examples, tasks, jokes etc, posibly a podcast. Finally, they can evaluate their own efforts today. This is a typical excerpt, but the structure varies from time to time.

Desired outcomes: Increased student reflection, activity, learning and communication.
Instructions: None needed except that I tell them what to do next.

Assessment of learners, forming of final score (indicate the percentage):

- ☐ Active participation in course (both web-based and face-to-face) .....%
- ☐ Participation in forums.....%
- ☐ Participation in seminars.....%
- ☐ Submission of individual assignments.....%
- ☐ Participation in group assignments.....%
- ☐ Submission of tests.....%
- ☐ Participation in contact days.....%
- ☐ Exam/ final assignment.....%

OUTCOMES AND EVALUATION

Outcomes and results:
Informal evaluation indicates that the students welcomes this form of education. It is also good because those that cannot join the lecture, can gain access to all the digital material from the LMS. They only miss the lecture and my "speaking".

Evaluation results (describe evaluation results, if a proper evaluation of course quality and outcomes have been done)

General evaluation of the course (write a general evaluation of the case)

CONTACT INFORMATION

Links to additional information
In Norwegian:
http://www.aitel.hist.no/~svendah/FoU/PPT/horgen-blended-learning-steinkjer-oktober-2006.ppt

Contact person (name, email, telephone):
Svend Andreas Horgen, svend.horgen@hist.no, http://aitel.hist.no/~svendah and http://gjemmesiden.blogspot.com

COURSE DESCRIPTION

Name of the course:
ICT in Learning (master's programme)

University, Department, Country:
Stord/Haugesund University College, Department of Teacher Education, Norway

No of ECTS:
120

Language:
Norwegian

Area of science:
Educatioan and ICT

Level of studies:
Master

Course type:
On-line and auditorium lectures, practical ICT-lab work, projects

Study context:
Master Degree Study, integration and application of ICT in learning

Target group:
Teacher students, teachers and developers of ICT based learning environments

Course description:
The central goal of this study is the use and integration of ICT in education. It is not a series of courses course in technology and in learning theories as separate disciplines. The whole study is based on ideas from similar studies for ICT and learning in other countries. It ha its roots in teacher education and composes the forth and fifth year of a 5 year complete study programme leading up to a teacher certificate and a Master degree in ICT in learning.

The study consists (2006) of 8 courses over 2 years

- Learning material (existing, general) (10 cr)
- E-learning (20 cr)
- Development (of material) (20 cr)
- Learning theories (10 cr)
- Research methods (10 cr)

- Data collection, storage, retrieval (10 cr)
- Didactic research (10 cr)
- Master thesis (30 cr)

(to be revised in 2007):

Course literature:

Alessi, S. M. & Trollip, S. R. (2001). *Multimedia for learning - Methods and development*. Needham Heights, Massachusetts: Allyn & Bacon

Bing, J. (2000). *Menneskers verk - om åndsverk, opphavsrett og kopiering*. Oslo: Universitetet i Oslo, Institutt for rettsinformatikk. http://www.kopinor.no/opphavsrett/artikler_og_foredrag/menneskers_verk

Kristensen, T. (2000). *Informasjon, kommunikasjon og teknologi*. Oslo: Cappelen akademisk forlag

Atherton, J. S. (2003). *Learning and Teaching: Learning index*. [Online]. http://www.learningandteaching.info/

Salomon, G. & Dekel, A. (2004). *An e-learning course on LEARNING*. Nettressurs HSH

Dysthe, O. & Engelsen, K. S. (red.) (2003) *Mapper som pedagogisk redskap. Perspektiver og erfaringer*. Oslo: Abstrakt Forlag.

Jonassen, D. H., Carr, C., Yeuh, H-P. (1998): Computers as Mindtools for Engaging Learners in Critical Thinking. (Paper på Tech-Trends, mars 1998) http://tiger.coe.missouri.edu/~jonassen/Mindtools.pdf

Salmon, G. (2002) *E-tivities: The Key to Active Online Learning*. London: Kogan Page.

Sigmundson, H. & Bostad, F. (red.). (2004). *Læring: grunnbok i læring, teknologi og samfunn*. Oslo: Universitetsforlaget

Bertheussen, B. (2002). *Visual Basic.NET i teori og praksis*. Tromsø: EDB kunnskap.

Minken, I. & Stenseth, B. (1992). *Brukerorientert Programdesign*. Oslo: Kirke-, utdannings- og forskningsdepartementet

Ask, F. F. (1998). *Elementær statistikk. En pedagogisk innføring*. Grimstad: Unikurs.

Kvale, S. (2001). *Det kvalitative forskningsintervju*. Oslo: Gyldendal Akademiske.

Patel, R. & Davidson, B. (1995). *Forskningsmetodikkens grunnlag* : å planlegge, gjennomføre og rapportere en undersøkelse. Oslo: Universitetsforlaget.

Patton, M. Q. (1987). *How to use qualitative methods in evaluation*. Thousand Oaks, London, New Dehli: SAGE Publications Ltd.

Tiller, T. (1999). *Aksjonslæring. Forskende partnerskap i skolen*. Kristiansand: Høyskoleforlaget.

Torgersen, G.-E. & Vavik, L. (2004). *Forskningsmetode i IKT-pedagogikk : om å drive FoU i pedagogisk bruk av IKT : en studie- og aktivitetsbok for lærere og ledere i skole og opplæring*. Stjørdal: Læringsforlaget.

Yin, R. K. (1994). *Case Study Research. Design and Methods*. Thousand Oaks, London, New Dehli: SAGE Publications Ltd.

Access 2003. Steinkjer: DataPower.

Rob, P. (2002). *Database systems : design, implementation, and management*. Cambridge, Mass: Thompson Learning.

Torgersen, G.-E. & Vavik, L. (2004). F*orskningsmetode i IKT-pedagogikk : om å drive FoU i pedagogisk bruk av IKT : en studie- og aktivitetsbok for lærere og ledere i skole og opplæring*. Stjørdal: Læringsforlaget

Lorentzen, S., Streitlien, Å., Tarrou, A.-L. H. og Aase, L. (1998). *Innføring i fagdidaktikkens forutsetninger og utvikling*. Oslo: Universitetsforlaget.

Schnack, K. (Red.). (2004). *Didaktik på kryds og tværs*. København: Danmarks Pædagogiske Universitets Forlag.

Schnack, K. & Kristensen, H. J. (Red.). (2000). *Faglighed og undervisning*. København: Gyldendal

Additional materials:

Learning material distributed via Internet

Course website:
http://stud.hsh.no/lu/inf/master/
General access to the chosen LMS (Fronter) is necessary for learning activities

Number of students:
40

Number of teachers:
7

Number of tutors:
6

PEDAGOGY

Learning objectives:
The students shall learn theories, technology and methods related to use of digital tools in learning. The use and integration of ICT in education is a central learning objective

Pedagogical approach:
Different courses in the master study are based on pedagogical approaches relevant for the course content. Applied theories and models are:

- Collaborative learning and constructivist learning
- Problem based learning
- Project based learning

The courses in the study program uses:

- Local teaching and tutoring
- Net based guidance
- Mandatory seminars where all students meet physically at the university college (may be arranged as virtual (video) seminars)

All approaches are applied and adapted to teaching and guiding of both on-campus and off-campus students.

Innovative elements:
Developing methods for teaching and guidance of on campus and off campus students in the same course and leaning environment, and the integration of synchronous and on-demand streaming video.
Extensive use of socioconstructivist learning methods is still innovative for mature students.

Main pedagogical references:
N/A

TECNOLOGY

Use of technology:
The master study is organised for both on-campus and off-campus students. To give an adequate study program to these groups, the study uses the Internet and a Learning Management Systems to a great extant. Tasks that are carried out with these tools are:

- Distribution of material
- Broadcast of live and on-demand video
- Interaction teacher-student and student-student
  - Synchronous communication
  - A synchronous communication
- Guidance

Cooperation and collaboration

Description of how technology is used:
The technology is especially justified to make an integrated learning environment for both on campus and off campus students.

Innovative elements:
Live and on demand broadcast of video makes the course available related to the students needs.
Use of technology for cooperation between students, especially on different tasks in the study.

BLENDING METHOD

Detailed description:
Detailed description of what makes the course a “Blended Learning” course; how face-to-face and other learning activities are combined with technology based learning.

Teaching in auditorium or classroom is a relatively small part of the course. This is for some of the courses broadcasted as live and on demand videos.
Guidance is given related to the location of the students. On campus students are given guidance face-to-face - as well as via the Internet, and off campus students are given guidance through email, learning management systems, synchronous communication like MSN and asynchronous communication like discussion forums. In practice we see that also the on campus students to a grate extent uses the same tools as the off campus students.
Communications between students, in a group composed by on campus and off campus students, are also much based on synchronous and asynchronous communication tools.

Please also describe,...
1. How is the Content presented. If possible, estimate also the proportions in percentages
☒ Face to face lectures .....%
☒ PowerPoint presentations .....%
☒ Electronic materials in web, LMS, full text or slides.....%

☒ Video streaming, archived video lectures, video conferences……%
☐ Audio streaming, archived audio lectures……%
☐ Animations……%
☒ Graphs, illustrative figures and images……%
☐ Integrated solutions (slides in combination with audio or video) ……%
☐ CDs, DVDs……%
☐ more, specify ……%

2. Which of the following sections of the course are managed web-based:
☒ Communication
☒ Group Study
☒ Study guide presentation
☒ Content presentation
☒ Feedback, technical support, course assistance
☒ Administrative information (contacts, requirements, expected learning results, etc)
☒ Assignments
☒ Assessment
☐ Tests
☐ Self-tests
☐ Self-evaluation
☐ Additional materials

DESCRIPTION OF STUDY PROCESS

Please list the learning activities:

Starting from teacher trainingn background at bachelor lever, gradually introducing scientific methods at master level, preparing for research and master thesis.
Practical and theoretical integration of ICT in different learning methods.
Formulation of problem area for the master thesis
Please describe 2-3 main learning activities in detail. Suggested frame for learning activity (method) description:

Construction of learning objects where ICT are used related to different learning theories.
Writing of an scientific essay for formulation of the problem area for the master these

The aim of the learning activity
Introduction to the learning activity
The description of the learning activity
- description
- desired outcomes
- instructions for performing the activity
- product form and length

submitting information
Criteria for assessment
Conclusions

Assessment of learners, forming of final score (indicate the percentage):
X Active participation in course (both web-based and face-to-face) .....%
X Participation in forums.....%
X Participation in seminars.....%
☒ Submission of individual assignments.....%
X Participation in group assignments.....%
☐ Submission of tests.....%
☐ Participation in contact days.....%
☐ Exam/ final assignment.....%

OUTCOMES AND EVALUATION

20 students graduated as master of ICT in Learning so far; good results
Online evaluation questionnaires to students at end of individual courses are generally positive, but are also correctives for revision of content, methods and technology. A revised version of the master programme will start in August 2007.

CONTACT INFORMATION

Links to additional information
http://stud.hsh.no/lu/inf/master/ (in Norwegian)
http://www.hsh.no/english/ICT_in_Learning.pdf (in English)

Contact person (name, email, telephone):
Jostein Tvedte
jostein.tvedte@hsh.no
+47 53 49 13 78

COURSE DESCRIPTION

Name of the course:
Global Environment Issues

University, Department, Country:
Agder University College, Faculty of Economics and Social Sciences. Norway

No of ECTS:
7 1/2

Language:
English

Area of science:
Environment

Level of studies:
Master Level

Course type:
Collaborative online learning in community of practice

Course description:

Aims

To get an overview of the global environmental situation, analyse the relationship between environmental factors and development issues seen from an environmental perspective, and to develop an understanding of what is meant by a sustainable development. Focus is on the global perspective. In addition, regional overviews on priority issues are offered. The course will challenge by giving alternative points of view regarding development of values, ethics and personal engagement. Opportunities for reflection on the learning environment and procedures are given, and the student is expected to develop his or her own learning skills.

Objectives

On completion of the GEI course the students should have the ability to:

Describe, discuss and present main global environmental issues such as the greenhouse effect and climate change, biodiversity, freshwater shortage, ozone depletion, persistent pollutants and eutrophication as short lectures to an audience of non-academics.

- Analyse and explain some major regional environmental issues to peers in online discussions and essays
- Discuss and evaluate some environmental assessment processes and present the results to peers using ICT media of communication
- Compare, analyse and assess different view points on interaction between environment and development in the global context,

discuss these viewpoints online with peers and present the results in short lectures and essays.

- Discuss inter- relatedness of the specific elements of the environment and describe main scenarios applying ecological terms and methods.

The students will gain / improve skills in:
- constructive examination of the major environmental outcomes of policies and practices;
- making informed strategic decisions based on development scenarios;
- collaborative work on-line and face-to-face with peers by sharing ideas, analyzing problems and finding solutions;
- Summarizing and evaluating arguments
- balancing and integrating different points of view in a decision making process;
- writing academic deliverables
- environmental information communication;
- reflecting on personal learning processes and improvement of learning skills.

The students should have developed or strengthened attitudes on:
- Environmental and development values and ethics and be able to express this in structured presentations

Module 1: Background.
A shift in focus from picking trash at the roadside to pesticides, global warming, depletion of the ozone layer, biodiversity and GMOs: Development of the environmental process including a recent history of events, policies and practices.

Module 2: The State of the Environment
Overview of the global State of the Environment (SOE), reporting processes and the state of the environment in different regions of the world. Main issues pertaining to environmental assessment, and major environmental changes during the last decades.

Module 3: Vulnerability, risk assessment and adaptation
Human vulnerability to changes in the environment: how people are affected and possible ways of assessing risks, adaptation and vulnerability reduction.

Module 4: Driving forces and scenarios
Introduction to scenario analysis as a means by which to reflect on how decisions, including policy changes, impact the future. Major driving forces behind environment change.

Module 5: Achieving sustainable development?
Tools for strengthening and promoting sustainable environmental development. Policy performance monitoring, international policy framework, the use of trade and technology in sustainable development. Predictions and scenarios.

Course literature:
Study guide.
Global Environment Outlook 3. UNEP Earthscan, UK 2002.
Geo yearbook: an overview of our changing environment 2004/05 UNEP

Nellemann et al. (2004): The fall of the water. UNEP

EarthCouncil Learning Center. Bjorke (2004): Greenhouse effect and Climate Change
http://www.earthcouncil.com/earthcouncil/

Synthesis report. Millennium Ecosystem Assessment. (2005) Island Press.
http://www.maweb.org//en/Products.Synthesis.aspx

Pestel, E.: Abstract on “Limits to Growth”.A Report to The Club of Rome (1972)
http://www.grida.no/gvugeo/aicc/Timeline/003.htm

Speth, G: “Recycling Environmentalism”, U.S. Council on Environmental Quality 2002
http://www.creationethics.org/index.cfm?fuseaction=webpage&page_id=187

UN Millennium Declaration. General Assembly Sept. 2000
http://www.un.org/millennium/declaration/ares552e.pdf

On-line and on CD: learning resources library with articles, videos, URL-list etc
http://gvu.unu.edu/resources.htm

Additional materials:
CD-ROM with self-instructional course in Climate change and other learning resources

Course website:
Not available

Number of students:
24

Number of teachers:
1

Number of tutors:
1

PEDAGOGY

Learning objectives:
See description above

Pedagogical approach:
Mainly social constructivist collaborative learning in communities of practice

Innovative elements:
The pedagogy, a mixture of collaborative learning and self-instructional course. Quality assured study site system

Main pedagogical references:
http://gvu.unu.edu/prog.cfm?pageid=1037&programid=101&courseid=1024

TECNOLOGY

Use of technology:
LMS-Fronter, Internet, e-mail

Description of how technology is used:
Creation of virtual classroom and group rooms used for online conferencing and building of communities of practice

Justification of technology used:
It is a way of create virtual communities of practice where location of students in the world does not matter as long as they have an internet connection

Innovative elements:
Create intercontinental virtual communities of practice.

BLENDING METHOD

Detailed description:
Detailed description of what makes the course a “Blended Learning” course; how face-to-face and other learning activities are combined with technology based learning

Introduction
Experience indicate that there are clear advantages starting up an online course with a face-to-face-session (F2F). Distance studies are associated with high drop-out rates. More than 50% drop-out rates in a degree-giving study programme is quite usual (Simpson,2002,p.9). Studying at a distance is an isolating experience, and “is probably the most important factor in drop out; students who fail to establish support networks are more likely to withdraw” (Simpson,2002,p.10). This is probably true whether the student studies at a distance or on campus, as education to a large extent can be seen as a process of dialogue (Simpson,2002,p.10). A face-to-face introduction period to a two-year study will, appropriately planned and implemented, knit the group of students and tutors together in a network of personal relations strong enough to keep up motivation, enhance and facilitate online collaboration, and make the learning environment in the virtual classroom open, empathic and approachable. These are crucial factors for student retention.

The GEDS students

The GEDS students will mainly come from Northern Europe and from some African countries. Maybe there will also be students from Asia. Advantaged students, like most Norwegians, will have free tuition, and easy access to the internet. Most of them will have some prior experience of collaborative leaning, and they will most likely have some experience with the chosen LMS: the Classfronter. Some of them will even, as on-campus students, have direct access to subject professors. These students might face some problems to struggle with, starting studying in a virtual classroom with an unfamiliar pedagogical approach. However, their African peers, will have a much more challenging workday. Their access to the internet will often be poor, they might have to pay extra for it, and they will probably not have the supportive infrastructure around them as a Norwegian on-campus student will have. Nevertheless, African and Northern European students will have to collaborate in mandatory group work during much of the study programme. The collaboration will face the challenge of unequal access, different cultural backgrounds, varying language skills, although having in common that English will be second or third language to all or almost all, and different experience in pedagogical approaches. It is therefore important to ensure that all the students start out on the same platform: a two-weeks face-to-face introduction to the study programme in Norway. It is of equal importance that the tutors get to know the students.

Aims of the F2F session

a. Save time learning the technology. The students will get hands-on guidance in the use of different computing software such as power point, a web-editor and software for photo and graphics editing. They will get extensive hands-on guidance in the use of the LMS Classfronter, learning asynchronous computer mediated conferencing (CMC) such as "brainstorming", threaded discussions, synchronous "chat", making folders, upload files. The two first GEDS courses will start, and the first online activities in the virtual classroom will take place with tutors present. The students will make their personal online introductions, and take part in developing the virtual classroom. Tutors will be present at all times to guide and assist.
b. All participants (students and teachers) get to know each other personally. This facilitates learning, in particular the important informal communication enhancing the learning processes.
c. Participants will familiarize themselves in practice with the GEDS approach to learning: learner-centred, collaborative studies in communities of practice.
d. Participants will get a good start on the two first courses, and an introduction to the two following.
e. Participants will get an overview of the student support system and how to use it

Participants will develop a sense of participating in a global environment in a UN spirit, and a sense of belonging to the UN family.

Face-to-face sessions for socialisation, interaction, social presence and tutor support

In order to interact and collaborate well, people need to know each other. A F2F session at the beginning of a learning period, allows the participants to make personal ties.

Professor Mary Thorpe defines learner support in ODL as a system capable of responding to a known learner or group of learners. The key issue is "interactivity between individuals known to each other" ...it involves interpersonal interaction between people where each knows the identity of the others and each has a specific role with regard to the other"(Thorpe,p.48).

"It has often been found that adult learners can work at a distance for months, geographically isolated from each other and from a tutor, if they have had at least one effective face-to-face meeting to begin the process. Groups set up for Computer Mediated Communication (CMC) have similarly often worked better when the learners have met and talked together, even if only briefly"(Thorpe, p. 64).

Many distance students complain about their sense of isolation, and that they have little opportunity of discussing difficult issues in their studies informally with peers. This is probably a main reason for high dropout rates in traditional DL. Experience indicates that "tutorial support for learners prevents drop-out from study" (Thorpe,p.50) In my own experience as an online tutor as well as an online student, I have no doubt that tutor support is crucial for a good learning environment. "Many practitioners and learners believe that such support is vital for effective learning. Interactivity between learners and their supporters is essential for high-quality learners…the potential for interaction enabled by CMC is driving the development of support-led rather than package –led forms of Open and Distance Learning (ODL)" (Thorpe, p. 48). Package-led forms of education is associated with "2nd generation" DL, where in its extreme, the student received a package with books and a multimedia CD-ROM guiding him through the course with online lectures, quizzes and other type of student-machine interaction. In principle, no contact between the student and the university would be necessary before the exam. In contrast, support-led, "3rd generation" DL is associated with various support structures assisting the student in the studies. Such support is given by tutors, administration and many-to-many communication in virtual classrooms through an LMS. Students may be offered tutoring, guidance, counselling and mentoring; helping the student develop cognitive as well as organisational and affective skills (Simpson, 2002, pp.9-15).

A F2F session allows tutors to get personally acquainted with their students. This is particularly important with a very heterogeneous student group coming from different countries, or even continents and with very different cultural backgrounds. The tutor will be able to help the individual better when having at least some idea how the novice student approaches learning. "An appreciation of learner characteristics acts as a framework for helping to understand possible reactions, patterns of response, predictable needs and so on" (Thorpe, p. 54). Feedback from many of my own online students strongly indicates that without my tutor support when they were struggling with technology or subject content, they would have dropped out. According to Thorpe (p.56), "the stimulus and responsiveness of a person in the role of guide or tutor are for most people essential catalysts that activate and sustain their involvement in the learning process".
"A successful online collaborative learning community is an organization where community members engage intellectually, mentally, socio-culturally, and interactively in various structured and unstructured activities to achieve their common learning goals via electronic communication technologies"(Tu&Corry,p.53). The better the participants know each other, students and tutors included, the easier it will be to create a good learning environment.

"One of the most useful concepts that CMC has generated is the idea of "social presence": the communication of personality and the sense of "voice" through text onscreen in the context of email and conferencing. Where moderators and tutors have acquired this skill, learners report a more conducive context for interaction and a sense of group belonging"(Thorpe,p.63.)

What kind of support do learners need?
This depends to some extent on at what stage of the course the student is. In the beginning, when the student struggles with technology, the feeling of alienation in an unknown learning environment in a virtual classroom, new curriculum and new terminology, reassurance and counselling are obviously important. The student must get the feeling that it is possible to get through this strange jungle of new and to some extent very different way of doing things.
This kind of support is probably easier to achieve in a F2F session, with hands-on training together with an instructor to step over the technology threshold into the virtual classroom relatively easy. Counselling is also easier face-to-face.

In the F2F session I suggest the following objectives:

1. Socialisation between the students and the tutors and the students. They should have established personal relations to the extent that they are able to give "warm affirmations", "empathic comprehension" and "open disclosure" (Zimmer,2004,p.

extent that they are able to give “warm affirmations”, “empathic comprehension” and “open disclosure” (Zimmer,2004,p.p.141-144) in order to obtain open and successful communication in online conferencing. They need to reassure each other that they can manage the course together, that they will support each other, and that they can trust each other.

2. The technological obstacles should be overcome in the F2F session. All participants should be able to log in to the virtual classroom, find their way in the classroom and the various tools, upload and download documents, participate in online brainstorming, synchronous conferences (chat) and asynchronous conferences such as a threaded asynchronous discussion on completion of the F2F session. They should know how to make a ppt presentation and publish articles, graphics and pictures on the web as well. The students should get to know the person they can contact when they have technical problems with Classfronter.

3. The pedagogical issues should be discussed and practiced. Many students have no or little experience in constructivist peda gogy and collaborative learning. The concepts of “surface learning”, deep learning” and “strategic learning” should be introduced and discussed. It is probably easier and quicker to initiate beginners to a collaborative learning environment at a F2F session than doing this strictly online. “The foundation of an effective interactive online collaborative learning community is communication. Instructors should initiate the course with a definition of an online collaborative learning community and explain its purposes and expectations to motivate learners to sustain online learning collaboration throughout the course”(Tu&Corry,p.54) “The main purpose of collaborative learning is to enrich learners’ critical thinking, information exchange, and knowledge-generating processes and to attain rich interactive learning experiences. If learners do not see the value of collaborative learning, they will focus only on achievement and will not engage effectively in collaborative activities. The perception acquired by learners involved in collaborative learning is very critical and success depends upon a clear understanding of its purposes and values. The instructor must assist students in developing this positive perception before any collaborative learning activities can occur”(Ibid,p57).

4. The students should be introduced to the various courses, get an overview of the contents and what is expected of the students. They must also get a clear picture of what they can expect from the GVU and the GEDS study programme.

5. The students must be introduced to and explained in detail the way they will be assessed. Assessment guidelines and criteria must be presented.

6. The students will be introduced to study guides with detailed tasks and activities.

7. The students will get a calendar that paces the course in time frames and deadlines. They must learn that within these time frames they are themselves responsible for learning what they are supposed to learn, take advantage of the possibility to learn together with their peers and tutors, and together build an optimal learning environment for all. They must also learn that the study guides can be negotiable to some extent, and if the workload peaks in one course, it should be possible to reduce workload at that time period in a parallel course.

8. The students should get acquainted with a university library and what services it may provide. If the students could visit the physical library that they will later contact online, this would probably facilitate the student’s use of this service.

9. The tutors will be introduced to the students, professors, the online course classrooms and the communication media they will use. A learner-centred tutor is committed “to enabling learners to make use of education and training systems, by using language that non-specialists understand”…”social presence is particularly important as an underpinning skill or ca-

10. The F2F will in addition to the above mentioned points be a strong motivating factor if the session succeeds in removing initial doubts and obstacles, installs a sense of social belonging, and initiates a supporting community of peers and tutors. When the tutors through personal relationships are able to provide effective communication and just-in-time feedback of the right type, this will also be a strong motivating factor. When there is a personal relation, it is also much easier to make a phone call to the tutor and ask for assistance in times when the many-to-many dialogue in the virtual classroom is inadequate.

Handling cultural differences

Cultural differences can be an issue in DL. In a global course as GEDS, differences of opinion should basically be a cause for celebration. After all, people who have in common that they have graduated from a university, have good computer skills, speak English fairly well and can take two years off for studying; belong to a small elite in the world. However, cultural differences will be present, and the participants should be aware of such differences in general. According to Hofstede (1980) there are mainly four dimensions by which cultures vary: power distance, uncertainty avoidance, collectivism-individualism and masculinity-femininity. Power distance describes the extent to which people are willing to accept unequal distribution of power in the society, while uncertainty avoidance describes the degree of willingness to tolerate deviation from the norms of the society. Some cultures think that the collective/tribal/clan interests must prevail over the interests of the individual, while others find that the individual interests are more important than the collective within the frames of formal laws. Some societies have decided that some values and prerogatives are strictly feminine while others are masculine. Other cultures propose equal rights and opportunities regardless of sex. As a global, UNU-associated course, UN values such as the Universal Declaration of Human Rights, equal rights, e.g. equality between the genders must prevail. Nevertheless, GEDS should facilitate interaction between different cultural groups, broaden perspectives and minimize the risk of "cultural tunnel vision". Culture should therefore be an issue for curiosity and exploration rather than prejudice and judging. Formal education in Africa have inherited much from colonial styles of education, with discipline and rote learning as norm, while students in Northern Europe increasingly have been encouraged to see themselves as independent learners. African students have traditionally been told "to work hard" in a competitive environment, striving to get to the top of the class achievement list by being the best in regurgitating information transmitted by the teachers. In contrast, many young Scandinavians have been educated in a learning system where deep learning and understanding have been in focus (Morgan 2004, p.p 55-58). Even if most of the GEDS students will be adults, at times discussions should consider possible communication barriers between Western and African students and how to overcome them "….given the fact that the socio-religious tradition is one of seeing the younger generation as necessarily in a position when they should take orders, listen to elders, their individuality or independent thinking or decision-making is not nurtured. Often these traditions and customs run contrary to the basic expectations required of open learners"…"while education means spreading awareness and lifting taboos, it does not mean violation of people's customs and traditions" (Priyadarshini, 1994, pp.458-462). These issues are probably easier to discuss at a F2F session, than online.

Another important issue to bring into the light is the pedagogical approach. Many students believe that "in operational terms students believe and feel they have been taught only if lectured to" (Shrestha,1997). The GEDS study programme requires that students participate in collaborative learning activities where the students to a large extent take responsibility for their own learning in cooperation with and support from a tutor and peer students. The success of the online studies much depends on the student's ability to participate in these activities. This student centred learning approach needs to be explained in detail at the F2F session. Metacognitive sessions with ample opportunities for discussing and reflecting on learning styles and learning about how to improve own learning methods must be given appropriate time.

Progression

To ensure a good development of the F2F session while avoiding information overload, it is important to see to that some activities precedes others in time. I suggest that the programme to a large extent follows the objectives set up for the session, starting up with socialisation and the building of personal relations, while avoiding the establishment of "cliques". Learning the LMS technology is crucial, and must come early. Collaboration in the virtual classroom will come naturally with easy assignments, even when the participants physically are present in the same room. The transition from physical presence to collaborating over distance with virtual presence only, should be made as smooth as possible. The pedagogical approach should be introduced, discussed and implemented in practice when starting up the first study modules.

Facilities and conclusions

On the background described above, I suggest that the tutors should participate on equal terms with the students all or most of the F2F time.

Students should be accommodated at a place close to nature, close to the GVU, with good but not luxurious rooms. Good Internet connections are a prerequisite, as are the availability of group rooms as the students should be able to do at least some work in the evenings. The accommodation building should also facilitate bringing the group tightly together socially. The F2F is the most expensive part of the study programme. It is therefore justifiable to make an intense programme, where training in relevant technology, learning methods and procedures, study techniques, support systems, cognitive subject matter, social knitting and exploring the surroundings all get a good share of the timetable.

References

Hofstede, G. (1980): *Culture's consequences: International differences in work-related values*. Beverly Hills, CA:Sage

Morgan, A.R. (2004): 'Student learning and students' experiences. Research, theory and practice', in Lockwood, F. (ed): *Open and distance learning today*, Routledge, London

Priadarshini, A. (1994): 'Support systems for a distance learning institute in a developing country' in *Conference Proceedings: Distance Education: Windows on the Future*, Wellington Correspondence School, New Zealand

Shrestha, G. (1997): *A Perspective on Cultural and Linguistic Problems Associated with Distance Education in Developing Countries*. URL: http://www.undp.org/info21/public/pb-pers.html Visited 6 June 2005

Simpson, O. (2002): *Supporting students in online, open and distance learning*, Kogan page, London.

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Tu, C.H. & Corry, M. (2003): Building Active Online Interaction via a Collaborative Learning Community. The Haworth Press, Inc. http://home.gwu.edu/~ctu/publication/2003/Build_Interaction.pdf accessed 7 May 2005

Zimmer, B. (2004): 'The empathy templates: a way to support collaborative learning'. In Lockwood, F.: *Open and distance learning today*, Routledge, London.

Please also describe,...
1. How is the Content presented. If possible, estimate also the proportions in percentages.
☐ Face to face lectures ...12...%
☐ PowerPoint presentations ...2...%
☐ Electronic materials in web, LMS, full text or slides...58...%
☐ Video streaming, archived video lectures, video conferences...1...%
☐ Audio streaming, archived audio lectures...12...%
☐ Animations...2...%
☐ Graphs, illustrative figures and images...10...%
☐ Integrated solutions (slides in combination with audio or video) ...2...%
☐ CDs, DVDs...1...%
☐ more, specify .....%

2. Which of the following sections of the course are managed web-based:
☒ Communication
☒ Group Study
☒ Study guide presentation
☒ Content presentation
☒ Feedback, technical support, course assistance
☒ Administrative information (contacts, requirements, expected learning results, etc)
☒ Assignments
☒ Assessment
☒ Tests
☒ Self-tests
☒ Self-evaluation
☒ Additional materials

DESCRIPTION OF STUDY PROCESS

Problem based learning, Collaborative activity, some self-instructional courses

The GEI course Module 1

Module 1: Background. The environment issue: a shift in focus.
A shift in focus from picking trash at the roadside to persistent pollutants, global warming, depletion of the ozone layer, biodiversity and GMOs: Development of the environmental process including a recent history of events, policies and practices.

Time frame, module 1: 24 October – 5 November
Aims, module 1
On completion of this block, the students should have developed an understanding of how awareness of the environment as an issue has changed and become more urgent to many people.

has changed and become more urgent to many people.

Objectives, module 1

Knowledge:
The students should be able to describe and apply in communication media of their choice :

- the main events in the recent history of environmentalism and its place in the overall historical context of the world
- the development of the major global environmental policies and practices
- the ”mainstream” environmental discourse and various differing opinions.

Skills:
The students should be able to participate efficiently in the e-learning environment, take part in distributed collaborative problem-based learning and computer mediated communication techniques

1.1.1 Task 1

Learn about and understand the shift in perception and awareness of the environment during the last five-six decades.

Activity 1 (6 hours)

Read the synthesis part and chapter 1 in GEO-3 (Set book). Browse the interactive “Timeline” with environment related event from the 1960’s until today. Find the “Timeline” in the resource library on your CD, or use the web-link below. Try to pick out early highlights, such as “Limits to growth”, Seveso catastrophe etc.
http://www.gvu.unu.edu/Timeline/index.htm

Activity 2 (12 hours)

a. Make an informal interview with at least one person above the age of 60. Ask about his/her perception of the environment in the early 60’s and compare it to his/her perception today. Does he or she remember any important events related to the environment 30-50 years ago? Why does he or she think the events were important?
b. Write an individual paper (maximum 500 words) on your findings. Compare to the “Timeline”. Place the document in your individual online portfolio.
c. Compare and discuss your findings with your group in the virtual classroom. Select a weaver and prepare a common paper on your findings. (Maximum 1000 words). Place document in group folder.

Activity 3 (4 hours)

Group discussion. Take part in a typical 1980’s discussion:
Topic: ‘Poverty is the worst form of pollution’
Indira Ghandi, Prime Minister of India (1966-77 and 1980-84)

This exercise is used to practice online collaboration and gather arguments that you can use for later essays. Look for information in the set book, in the time-line, in a library or on the Internet. Make reference to your sources. Keep your input short, in “postcard” style! A “thread” can be a definition, an argument or a statement of your personal opinion

1.1.2 Task 2

Learn about the main global environment issues and how these may be connected to development.

Activity 1 (10 hours)
Read the UN Millennium Declaration, General Assembly, September 2000
http://www.un.org/millennium/declaration/ares552e.pdf
and the Synthesis report of the Millennium Ecosystems Assessment. Browse the resources on the website: http://www.maweb.org/en/Newsroom.aspx

Activity 2 (20 hours)
a. Search for relevant information and discuss in your group:
"The present three most urgent global environment issues".
Select a moderator and a weaver. Write a group essay, maximum 3000 words, and place in group folder.
b. Based on your essay, prepare a 20 minutes lecture using power point with the same title for an audience of a Lion's, Rotary club, or similar. Alternatively: make the presentation on a website. Put presentation in group folder.

Reflection and evaluation: (1 hour)
The feedback obtained from this exercise is mainly meant for the tutors for the students themselves. The evaluation is formative in the sense that it benefits the current learners and teachers, and to some extent those who are to update the course. It is important that the participants reflect on their learning experience and how it can improve.
This exercise should take one hour or less. The answers given are confidential and must not go outside the online group or classroom unless the information is anonymized. The tutors may give relevant anonymized information to the course developers for revision of the course.

Reflection:
1. Repeat the objectives of the module. Did you learn what you were supposed to learn in this module?
2. Was it easier or more difficult than you thought?
3. What was easy, what was difficult? Why?
4. What did you find the most useful/enjoy the most, if any, in the module? Why?
5. What did you find the least useful/least enjoyable, if any, in the module? Why?
6. Would you say that your own confidence in subject understanding has grown?
7. Would you say that you have developed your study skills? If so, in what way?
8. Can you think of any way you can improve your own ways of learning?

Evaluation:
9. Was the time estimate for each activity roughly correct?
10. Do you think that the interaction and discussions with your fellow students and tutor during this module could improve in any way?
11. Do you think that the tutor should have been more or less active, or has s/he found the right balance?
12. Have the tutor's comments been well-chosen, encouraging and in sufficient quantity?
13. Do you think that the tutor is easily enough approachable and empathic, or do you think there is too much distance?
14. Do you have any proposals for improvements of the module

Assessment of learners, forming of final score (indicate the percentage):

- Active participation in course (both web-based and face-to-face) ...10...%
- Participation in forums.....%
- Participation in seminars.....%
- Submission of individual assignments40.....%
- Participation in group assignments.....%
- Submission of tests.....%
- Participation in contact days.....%
- Exam/ final assignment...50...%

OUTCOMES AND EVALUATION

Outcomes and results:
Good

Evaluation results:
Above average

General evaluation of the course:
Well received

CONTACT INFORMATION

Links to additional information:
http://gvu.unu.edu

Articles and other references:
http://gvu.unu.edu/linklib.cfm?pageid=1045&categoryid=102

Contact person (name, email, telephone):
Åke Bjørke, bjoerke@grida.no ,+4792047626
http://www.grida.no/Contact.aspx?staffID=6

COURSE DESCRIPTION

Name of the course:
Learning theories

University, Department, Country:
Stord/Haugesund University College Department of Teacher Education Norway

No of ECTS:
10 cr of the Master Degree Study “ICT in learning”

Language:
Norwegian

Area of science:
ICT

Level of studies:
Master

Course type:
Lecture

Course description:
In this module the students shall learn theories and methods related to use of digital tools in learning. A central goal is the use and integration of ICT in education

Content:
Main guidelines related to learning
Memory
Meta cognition
Transfer of learning/knowledge
Social learning

The different theories shall be related to practical situations and experiences.

Course literature:
Alessi, S. M. & Trollip, S. R. (2001). *Multimedia for learning - Methods and development*. Needham Heights, Massachusetts: Allyn & Bacon
Atherton, J. S. (2003). *Learning and Teaching: Learning index*. [Online]. http://www.learningandteaching.info/
Salomon, G. & Dekel, A. (2004). *An e-learning course on LEARNING*. Nettressurs HSH
Learning material distributed via Internett

Course website:
General access to the chosen LMS (Fronter) is necessary.

Number of students:
30

Number of teachers:
3

Number of tutors:
3

PEDAGOGY

Learning objectives:
The students shall learn theories and methods related to use of digital tools in learning. The use and integration of ICT in education is a central learning objective.

Pedagogical approach:
Pedagogical approaches are:
Collaborative learning and constructivist learning
Problem based learning
Project based learning

All theories are related and adapted to teaching and guiding of both on-campus and off-campus students.

Innovative elements:
Developing methods for teaching and guidance of on campus and off campus students in the same course and leaning environment.

TECNOLOGY

Use of technology:
Learning management systems
Learning management systems
Email
Chat
Videoconferencing
Video broadcast

Description of how technology is used:
The course is organised for both on-campus and off-campus students. To give an adequate study program to these groups, the study uses the Internet and Learning Management Systems to a great extant. Tasks that are carried out with these tools are:
Distribution of material
Broadcast of live and on-demand video
Interaction teacher-student and student-student
Synchronous communication
Asynchronous communication
Guidance
Cooperation and collaboration

Justification of technology used:
The technology is especially justified to make a integrated learning environment for both on campus and off campus students.

Innovative elements:
Live and on demand broadcast of video makes the course available related to the students needs.
Use of technology for cooperation between students, especially on different tasks in the study.

BLENDING METHOD

Detailed description:
The lecturing in the classroom is a relatively small part of the course. This is broadcasted as live and on demand videos. Guidance is given related to the location of the students. On campus students are given guidance face-to-face, and off campus students are given guidance through email, learning management systems, synchronous communication like MSN and asynchronous communication like discussion forums. In practice we see that also the on campus students to a grate extent uses the same tools as the off campus students. Communications between students, in a group composed by on campus and off campus students, are also much based on synchronous and asynchronous communication tools.

Please also describe,...
1. How is the Content presented. If possible, estimate also the proportions in percentages.
☒ Face to face lectures .....%
☒ PowerPoint presentations .....%
☒ Electronic materials in web, LMS, full text or slides.....%
☒ Video streaming, archived video lectures, video conferences.....%
☐ Audio streaming, archived audio lectures.....%
☐ Animations.....%
☒ Graphs, illustrative figures and images.....%
☐ Integrated solutions (slides in combination with audio or video) .....%
☐ CDs, DVDs.....%
☐ more, specify .....%

2. Which of the following sections of the course are managed web-based:
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☒ Content presentation
☒ Feedback, technical support, course assistance
☒ Administrative information (contacts, requirements, expected learning results, etc)
☒ Assignments
☒ Assessment
☐ Tests
☐ Self-tests
☐ Self-evaluation
☐ Additional materials

DESCRIPTION OF STUDY PROCESS

Overview of learning theories.
Integration of ICT in different learning methods.
Formulation of problem area for the master these
Construction of learning objects where ICT are used related to different learning theories.
Writing of an scientific essay for formulation of the problem area for the master these
The aim of the learning activity
Introduction to the learning activity
The description of the learning activity
- description
- desired outcomes
- instructions for performing the activity
- product form and length
- submitting information

Criteria for assessment
Conclusions

Assessment of learners, forming of final score (indicate the percentage):
☐ Active participation in course (both web-based and face-to-face) ...10...%
☐ Participation in forums.....%
☐ Participation in seminars.....%
☒ Submission of individual assignments40.....%
☐ Participation in group assignments.....%
☐ Submission of tests.....%
☐ Participation in contact days.....%
☐ Exam/ final assignment...50...%

OUTCOMES AND EVALUATION

Evaluation results:
40 master students have completed the course, with a very low drop-out rate.
The students have given overall, positive feed-back to the teachers.

CONTACT INFORMATION

Links to additional information:
http://stud.hsh.no/lu/inf/master/ (in Norwegian)
http://www.hsh.no/english/ICT_in_Learning.pdf (in English)

Contact person (name, email, telephone):
Jostein Tvedte
jostein.tvedte@hsh.no
+47 53 49 13 78

COURSE DESCRIPTION

Name of the course:
Mathematical Programming

University, Department, Country:
Vytautas Magnus University, Department of Applied Informatics, Kaunas, Lithuania

No of ECTS:
6

Language:
Lithuanian, English

Area of science:
mathematics

Level of studies:
undergraduate studies (fourth year of studies)

Course type:
lectures+laboratories+individual studies+online collaboration and communication+work project

Course description:
This course combines theoretical and practical spheres, but is more oriented to practical tasks solutions in purpose that the student would learn to formulate practical optimization tasks which are based on mathematical terminology, would be able to establish chosen model's suitability and complexity, would be able to choose suitable algorithm which will appropriate for practical and mathematical formulated task solution, would be able to understand the optimization's results, would be able to advice others on questions connected with optimization methods and software.

The course deals with classification of problems and solution methods (Gradient method, Conjugate gradient method. Newton method and its modifications. Search methods), convex sets and functions, global optimization. Minimum conditions for the problems with constraints. Penalty and barrier methods for the problems with constraints. Linear programming. Basic solutions. Simplex algorithm. Polynomial complexity methods for linear programming. Multicriterial optimization.

Creating this course it was paid a lot of attention to the accumulative experience in the science analysis in the optimization sphere also as example was taken teaching in similar disciplines.

Course literature:
1) Antanas Žilinskas, Matematinis programavimas (pdf and html formats, in Lithuanian)
2) Benny Yakir, Nonlinear optimization (pdf format)

3) Jonas Mockus, Global and discrete optimization (html format)
4) Article: “Jens Clausen Teaching Duality in Linear Programming - the Multiplier Approach’ (pdf format)

Additional materials:
1. Žilinskas A. Matematinis programavimas. VDU, 1999, in Lithuanian.
2. Bazaraa M., Sherali H., Sheti C., Nonlinear programming. J.Wiley, 1993
3. Bertsekas D. Nolinear Programming. Athea Scienfic,1995

Course website:
Website for taking and putting information for studies, in Lithuanian (http://fcim.vdu.lt/Conferences/F00017C98/F00052D02/?WasRead=1)
The dictionary of the main concepts with the links to wider manuals (http://mathworld.wolfram.com/)

Number of students:
around 100

Number of teachers:
1 and one assistant

Number of tutors:
1

PEDAGOGY

Learning objectives:
To master theory of optimization and main algorithms, to learn adapt optimization methods for the practical tasks, to learn how to use software which has optimization packages.
During theoretical and practical lessons student learns to formulate practical tasks of optimization using mathematical terminology, to establish chosen model’s suitability and complexity, to choose suitable algorithm which will appropriate for practical and mathematical formulated tasks solution, be able to understand the optimization’s results, be able to advice others on questions connected with optimization methods and software.

Pedagogical approach:
The course was prepared under strong influence of methodology of Project Based Learning (PBL). Required courses in manufacturing systems and simulation build upon these skills and provide engineering design experiences. Traditional teaching is combined with problem based, project based and discussion based teaching. Students study the theoretical part by themselves and sometimes go to the lectures also they can take lessons online (there they can find records of the lessons). During the discussions they have to discuss about the topic which professor suggested during the lesson or which is put in the page. All the assignments they have to do and the deadlines of the projects (it is on the electronic calendar) and works they can find on the same webpage. Also here is the schedule of the lessons and consultation time with the assistant or professor.

Innovative elements:
Problem-Based Learning (PBL) model sets out what you can do to successfully come up with a solution. Student has to check his/her understanding of the scenario and situation by discussing it within a team (virtual environment and communication tools in it let do to that very easily and comfortable). The student should make a list in which it will be visible "What do I know?" on one or other topic and also the team can list everything what team knows about this situation, including, information contained in the scenario. Also the list "What do we need to know?" is valuable. After preparing a list of team questions that need to be answered to solve the problem students can communicate with the lecturer online in the forums or during the lessons (also online lessons). Questions may be in the form of requests for more information. Students divide responsibility for gathering, organizing, analyzing, and interpreting information from many sources. Exchange ideas; think about solutions; weigh alternatives; and consider the pros and cons of possible courses of action. At this point, individual student and team may formulate and test new hypotheses concerning the problem. Some problems may not require hypotheses. Propose a recommended solution or opinion (based on your team's research data). And then they prepare a report or presentation in which they make recommendations, predictions, inferences, or other appropriate solutions to the problem. Be prepared to support the positions you take. If appropriate, consider a multimedia presentation using images, graphics, or sound.

Main pedagogical references:
Problem Based Learning methodology PBL, http://www.udel.edu/pbl/
The Power of Problem-Based Learning, A Practical "How To" For Teaching Undergraduate Courses in Any Discipline, *edited by Barbara Duch, Susan Gron, and Deborah Allen*, Stylus Publishing, LLC (2001), 256 page

TECNOLOGY

Use of technology:
1) WWW page
2) Also electronic dictionary with the links for wider information
3) Discussions' forum
4) E-mail for contacting with the professor
5) Videoconferencing for online lessons
6) Virtual learning environment (FirstClass)

Description of how technology is used :
The instructions of practical work are presented on the WWW home page of the course. Some illustrative materials and examples of problem solutions, prepared by students, are also available at the home page as well as advanced theoretical material (e.g. lectures by prof. J.Clausen) and references to software.

Justification of technology use:
Creating educational materials allows teachers to incorporate their own teaching philosophy and methods into classroom presentations and multimedia technology allows teachers to compose effective presentations in advance. Time spent developing material is cumulative, since materials may be rearranged and reused with total control. Virtual Learning Environment facilitates teachers work in the management of educational courses for their students, especially by helping teachers and students with course administration. The system can often track the learners' progress, which can be monitored by both teachers and learners. While often

thought of as primarily tools for distance education, they are most often used to supplement face-to-face classroom.

BLENDING METHOD

Detailed description:

Blended Learning: combining both - traditional lectures (face-to-face) (15 lessons, each of the lesson takes 2 hours) and seminars plus distant collaboration with the students (discussions' forums, online questionnaires, videoconference meetings online (6 lectures, each takes 1.5 hours), students can find all the material in the virtual environment, also they put their projects, laboratories, other works in the virtual environment under the password) (for individual work is given 52 hours and students have 15 lessons in the laboratory class, each of it takes 2 hours), and they use technologies to communicate and to exchange information, assignments and assessments.

Please also describe,...

1. How is the Content presented? If possible, estimate also the proportions in percentages

- ☒ Face to face lectures 28% (percentage is counted from all hours in the course)
- ☒ PowerPoint presentations 90% (percentage is counted from online and face to face lectures representation)
- ☒ Electronic materials in web, LMS, full text or slides 100% (everything of that students can find online)
- ☒ Video streaming, archived video lectures, video conferences 100% (everything of that students can find online)
- ☐ Audio streaming, archived audio lectures 0%
- ☐ Animations 0%
- ☒ Graphs, illustrative figures and images 25% (some kind of material is given in this way)
- ☒ Integrated solutions (slides in combination with audio or video) 100%
- ☐ CDs, DVDs 0%
- ☐ more, specify .....%

2. Which of the following sections of the course are managed web-based:

- ☒ Communication
- ☒ Group Study
- ☐ Study guide presentation
- ☒ Content presentation
- ☒ Feedback, technical support, course assistance
- ☒ Administrative information (contacts, requirements, expected learning results, etc)
- ☒ Assignments
- ☒ Assessment
- ☒ Tests
- ☒ Self-tests
- ☐ Self-evaluation
- ☒ Additional materials

DESCRIPTION OF STUDY PROCESS

1. Lectures
2. Reading and analysis of theoretical material
3. Web-mediated Metacognitive discussions
4. Watching a video lecture
5. Observation (self tests)
6. Practice (3 tasks)
7. 5 laboratory

A. The aim of the discussions: be able to understand, analyze course material and given information

The description of the learning activity
description
After the lesson discuss a problem on chosen topic with the peers and find the solution. Teacher should help students to understand lesson's content and material; explain parts which were not very clear or difficult for them. After discussion teacher should analyse given learner's information and to make a feedback.
desired outcomes
To see that the students have understood topic and are able to solve the problems
instructions for performing the activity
The discussion has to take place online and the students' participation is mandatory.
product form and length
Online forum. Duration of the discussion is one week.
submitting information
Solution of the problem. Logs of the discussion.

Criteria for assessment
Correctness of problem solution. Also, teacher can see logs and how active each student was during the discussion.

Conclusions
Each student after the discussion and theoretical material analysis should be able to understand discussed optimization method very well and be able to do test and to make practical tasks related to that topic.

B. The aim of the 3 task: be able to work out the task of linear programming geometrically.

The description of the learning activity
description
Work out the task of linear programming geometrically.
desired outcomes
Geometrically, the linear constraints define a convex polyhedron, which is called the feasible region. Students should present the convex polyhedron.

instructions for performing the activity
Read the theoretical material and work out the task.
product form and length
Word document. Duration – two weeks.
submitting information
The convex polyhedron as the result of linear programming task.

Criteria for assessment
Correctness of convex polyhedron.

Assessment of learners, forming of final score (indicate the percentage):
☐ Active participation in course (both web-based and face-to-face) 0 %
☐ Participation in forums 0 %
☐ Participation in seminars 0 %
☒ Submission of individual assignments 33%
☐ Participation in group assignments 0%
☒ Submission of tests 17 %
☐ Participation in contact days 0 %
☒ Exam/ final assignment 50 %

CONTACT INFORMATION

Links to additional information:
Website for taking and putting information for studies:
http://fcim.vdu.lt/Conferences/F00017C98/F00052D02/?WasRead=1

The dictionary of the main concepts with the links to wider manuals:
http://mathworld.wolfram.com/

Articles and other references:
Articles and other references (if available)
1. Žilinskas A. Matematinis programavimas. VDU, 1999, in Lithuanian
2. Bazaraa M., Sherali H., Sheti C., Nonlinear programming. J.Wiley, 1993
3. Bertsekas D. Nolinear Programming. Athea Scienfic,1995

Contact person (name, email, telephone):
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COURSE DESCRIPTION

Name of the course:
Requirements specification

University, Department, Country:
Kaunas University of Technology, Department of Software Engineering, Kaunas, Lithuania

No of ECTS:
6

Language:
Lithuanian

Area of science:
informatics

Level of studies:
Master studies.
Study Area of Technological Sciences. Study module “Requirements specification“ is for Master students who are studying in Software Systems Engineering programme and it is one of 4 research modules. Further modules according this programme are “Analysis of Software Systems architecture”, “Information technologies in project management”, “Software implementation investigation”.

Course type:
lectures+ +individual studies +online collaboration and communication +work project

Course description:
The main attention is paid to requirements analysis and specification (modules “Software Requirements Analysis” and “Simulation and Validation of Systems”). In such a way Master students learn methods and tools of the requirement analysis already in the beginning of the study program and afterwards they can use the acquired knowledge to form the requirements specification of the objective area under computerization according to the Master thesis. Two courses that generalize software engineering area – “Software Engineering Process” and “Software Engineering Management” – are delivered together with the above mentioned courses; these courses are purposed for expanding and deepening knowledge acquired in Bachelor’s studies. During project development students familiarize with the standards, prepare proposal, plan and requirement specification of the project. Main topics are: the software requirements document; Requirements evolution; Problem analysis; System model description; Data modelling; Functional and non-functional requirements; Using of prototypes for requirements specification; Developing of software requirements document.

Course literature:
Methodical material for “Project Management’: http://proin.ktu.lt/~kestas/Proj_vald/Kepure.html, in Lithuanian
Software Engineering Standards: http://soften.ktu.lt/~virga/mag_atmintine/1sem/standartai.htm
Other literature: http://soften.ktu.lt/~virga/mag_atmintine/interneteka.html

Additional materials:

1. I.Sommerville. Software Engineering. Addison-Wesley, 4,5, 6 editions
2. R.S. Presman and D.Ince. Software Engineering - A Practitioner's Approach. McGraw-Hill, 3, 4,5 editions
3. G.Booch. Object-Oriented Analysis and Design. The Benjamin/ Cummings Publishing Company,Inc., 1994
4. R Pooley and P Stevens. Using UML: Software Engineering with Objects and Components. Addison-Wesley, 1999
5. M.Cotterell, B.Hughes. Software Project Management. International Thompson Computer Press, 1995
6. G.Booch, J.Rumbaugh, I.Jacobson. Unified modeling language user guide. Addison-Wesley, 1998
7. I.Jacobson, G.Booch, J. Rumbaugh. The Unified Software Development Process. Addison-Wesley, 2000
8. J.Martin and J. Odell. Object-Oriented Methods:a Foundation. Second UML Edition. Prentice-Hall, 1998
9. C.Larman. Applying UML and Patterns. Prentice-Hall, 2000
etc.

Course website:

Website for taking and putting information for studies (http://www.soften.ktu.lt/~virga/mag_atmintine)
Also there are many examples and advice how to do practical works

Number of students:

around 60

Number of teachers:

1

Number of tutors:

1

PEDAGOGY

Learning objectives:

To teach students to understand and to learn methods and tools of the requirement analysis already in the beginning of the study program and afterwards they can use the acquired knowledge to form the requirements specification of the objective area under computerization according to the Master thesis

To combine theoretical knowledge and practical skills in order that students would be able to design and produce efficiently software systems which fulfil users' and clients' requirements

To provide students with knowledge and experience in such knowledge areas: Engineering Economy, Software Requirements, Software System Design

To teach to choose tools, methods and design methodology applicable to the development environment

To provide with the experience of organizing individual and team work and with skills of communicating and collaborating professionally

To teach to understand and to be able to improve the software engineering process

To develop the understanding of product quality, price, schedule abidance importance in software system production

To teach to prepare documentation completely and consistently, to present technical concepts in both written documents and verbal presentations

Pedagogical approach:
Combination theoretical knowledge and practical skills in order that students would be able to design and produce efficiently software systems which fulfil users' and clients' requirements, to teach to evaluate, analyze and simulate software system quality factors in order to ensure a disciplined and controllable development of a software system.

E-learning is widely used in studies. Studies management information is public and available on the Internet.

The main principle of study system is the wholeness of science and studies and design skills training, based on systematic and autonomous work of a student. The importance of practical design is especially highlighted. In other words: the main principle is - teaching by designing. So, from pedagogical approach it is Project based and Problem based learning.

In order that students would apply and deepen theoretical knowledge of general matters in real design, they design a large software system and their individual research schedules and deliverables are coordinated. In each stage of design within the given time, students create products that have to fulfil requirements set in advance

Innovative elements:
In this module, the objective to organize a course around a project is similar to a real industrial project.
The educational community itself is increasingly moving from lecture-format courses to team projects, problem-solving, direct involvement with actual development, and other formats that require students to exercise the ideas they are learning.

Main pedagogical references:
Problem Based Learning methodology PBL, http://www.udel.edu/pbl/
The Power of Problem-Based Learning, A Practical "How To" For Teaching Undergraduate Courses in Any Discipline, *edited by Barbara Duch, Susan Gron, and Deborah Allen*, Stylus Publishing, LLC (2001), 256 pages
Project Based Learning Handbook, http://www.bie.org/pbl/pblhandbook/index.php

TECNOLOGY

Use of technology:
1. Website (http://soften.ktu.lt/~virga/mag_atmintine/).
2. Information system created by each student individually (a portfolio)

3. E-mail
4. Forum created in the given address http://proin.ktu.lt

Description of how technology is used:
Website is used for the students in case to find project themes, document templates, examples, standards, requirements for deliverables, schedules, requirements for skills, project and software quality requirements. Assignments' deadlines and material needed for the course and works preparation are placed there also.
Information system is created by each student individually at the beginning of the course. It is mandatory to put all the required documents and works which student has done in this system. It is like a portfolio. Such information management systems are private; they can be accessed only with passwords as this is required by the majority of project customers.
E-mail is used for the communication with the professor.
Hot Master studies' problems are discussed in the online forum http://proin.ktu.lt

Justification of technology use:
Website where all the documents are published, is very important if students need to find any information connected with the course, also requirements and other needful information. There they can find news and announcements published by the teacher, also there is the table like a calendar in which it is written all the deadlines of the works, which students have to do.
Information system (a portfolio) is important not only for the student (he/she can safely store their documents and in case something would happen with the PC before exams or documents will be damaged, student will find all the backups in the information system). The teacher can see if all the documents are uploaded on time, if the student is dutiful and makes everything according to the requirements (this module is oriented to requirements specification, so, before the student describes requirements from the project customer, student should know what does it means to keep requirements by his/herself).
E-mails, forums are very important when students want to send needful information to the teacher or to communicate with professor or peers.

Innovative elements:
Students can work by themselves in distance way and also at the same time can easily communicate with the teacher. Student has own portfolio (information system) to store all material related with the project.
The information is achieved very easily using given website of the subject.

BLENDING METHOD

Detailed description:
Traditional lectures and seminars plus distant collaboration with the students, also usage of technologies to communicate and to exchange information, assignments and assessments.
Students have traditional lessons (face-to-face) each week but e-learning is widely used in studies. Without e-learning methods and online communication this module will be difficult.

Please also describe,...
1. How is the Content presented? If possible, estimate also the proportions in percentages
X Face to face lectures 20%

☒ PowerPoint presentations 10%
☒ Electronic materials in web, LMS, full text or slides 90%
☐ Video streaming, archived video lectures, video conferences……%
☐ Audio streaming, archived audio lectures……%
☐ Animations……%
☐ Graphs, illustrative figures and images……%
☐ Integrated solutions (slides in combination with audio or video) ……%
☐ CDs, DVDs……%
☐ more, specify ……%

2. Which of the following sections of the course are managed web-based:
☒ Communication
☐ Group Study
☐ Study guide presentation
☒ Content presentation
☒ Feedback, technical support, course assistance
☒ Administrative information (contacts, requirements, expected learning results, etc)
☒ Assignments
☒ Assessment
☐ Tests
☐ Self-tests
☐ Self-evaluation
☒ Additional materials

DESCRIPTION OF STUDY PROCESS

During project development students
1. Familiarize with the standards
2. Prepare proposal, plan and requirement specification of the project.
3. Have lectures
4. Reading and analysis of theoretical material
5. Web-mediated discussions
6. Seminars
7. Cumulate an information system (a portfolio)

Please describe 2-3 main learning activities in detail.
A. The aim of the learning activity: to train methodical work skills in a real industrial organization. Improved process maturity results in an increased productivity, better quality and more accurate schedule time. Therefore the “penalties“ system is used for the deviation from the project schedule.

The description of the learning activity

description
To prepare proposal for the customer, who could be interested in your product (project), make plan and requirement specification of the project.
desired outcomes
Proposal document, requirement document, works on time.
instructions for performing the activity
Analyze given material, try to find proposals example, make analysis of the systems (analogue), which are founded and similar to your idea, make literature analysis, find real partner who could be interested in your idea, give him/her description of your idea, pick up the requirements from the customer, try to suggest more ideas than he/she can give to you (you are specialist, so you know about project more than your customer)
product form and length
proposal document (about 10 pages), requirement document (about 20 pages)
submitting information
information should be made on time and each student should upload the documents to created individual information system (a portfolio) and send the information to the teacher by e-mail, that the work was done.

Criteria for assessment
documents should be prepared according to the teacher's requirements.

Conclusions
Good proposal and requirements specification is the beginning of successful work for your project!

B. The aim of the learning activity: to be able to present your ideas and be able to demonstrate effective communication skills

The description of the learning activity
description
To prepare the presentation of your project idea.
desired outcomes
Showing personal presentation skills and ability to express your idea.
instructions for performing the activity
Try to find the project idea, which you like than the work will be easier for you. During the presentation to the future customers try to create comfortable atmosphere that the students do not feel confused, frustrated and disappointed. The presentation should be not very long and not very short, but clear to the audience.
product form and length
PowerPoint presentation (at least 10 slides)
submitting information
Presentation (*.ppt) , each student should upload the documents to created individual information system (a portfolio) and send the information to the teacher by e-mail, that the work was done. When the teacher will appoint the time for presentation, each student should make a public presentation in front of the commission and audience.

Criteria for assessment
Clear presentation of project idea; skills of oral presentation; technique of using PowerPoint software.

Assessment of learners, forming of final score (indicate the percentage):
☒ Active participation in course (both web-based and face-to-face) 5 %
☐ Participation in forums .... %
☒ Participation in seminars 20 %
☒ Submission of individual assignments 50%
☐ Participation in group assignments .... %
☐ Submission of tests .... %
☐ Participation in contact days .... %
☒ Exam/ final assignment 25 %

OUTCOMES AND EVALUATION

Outcomes and results:
Evaluation should involve an assessment of the product produced, and an analysis of the effectiveness of the process used to create the product. The aims of evaluation are: to recognise those strategies and techniques which proved effective during the course of the project so that their use may be reinforced or expanded; and to identify areas in the process and product that need to be improved in the next project.

Evaluation results:
The benefit of evaluating a software project is greater understanding of the software project organization, software development organization and people that are involved. This understanding is essential for the ability to perform software process improvements.

After finishing four modules:
- The average grade for the project quality stated by Master project tutors is 9.72;
- Master students evaluated their projects on the average 8.33;
- The average grade for the Master project tutors' consultations stated by students is 8.28
- The average grade for Master project design process arrangement stated by students is 7.71
- 43% of students referred the number of Master project deliverables as too large, 57% - as sufficient and no student referred this number as too small
- The average grade for the Master students' work in the enterprises stated by practice tutors is very high – 9.93;
- Only 76% of students consider the practice as useful for their skills development;
- The practice place corresponded to the Master project topic for 62% of students

CONTACT INFORMATION

Links to additional information:
Methodical material for "Project Management': http://proin.ktu.lt/~kestas/Proj_vald/Kepure.html (in Lithuanian)
Software Engineering Standards: http://soften.ktu.lt/~virga/mag_atmintine/1sem/standartai.htm
Other literature: http://soften.ktu.lt/~virga/mag_atmintine/interneteka.html

Contact person (name, email, telephone):
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Conclusion

This volume provides some insights into the field of blended learning. As it has repeatedly been noted neither the term nor the trend is new. American corporate training has used blended learning applications for quite a long time. However, the European higher education pedagogy is more traditional in its nature and is liable to adopt all kinds of innovations with more scepticism. The realm of blended learning is challenging, especially in the context of changes occurring in the European higher education environment.

The current report provides an overview of blended learning literature and research in the field of blended learning. The research reports describe different opportunities for using blended learning methodology. The issues of 'How?' and 'Why?' are discussed. The opportunities and benefits, as well as the potential setbacks are described. But first of all – publishing the research reports was intended to give a short but wide-ranging outline the blended learning experience up to now.

The second part of the report describes the instant practices of blended learning from five European countries – Estonia, Finland, Lithuania, Norway and Portugal. These examples – all stemming from everyday practice of higher education institutions – whether best practice or maybe just good experience, brightly illustrate the value of blended learning. Our intention of showing these cases is primarily to encourage teachers at traditional universities to find new innovative ideas to apply and teach in both easy and acceptable ways, and also to show that blended learning is easy, gainful, and fun to the students.

The B-Learn Project has been designed to convey the encouraging message to lecturers in traditional university environments that using blended learning in their everyday pedagogical practices can be easy and practical. The Project partnership hopes that this quick introduction into blended learning models, theories and best practice presented in the current report has given some good ideas to start blending your teaching and learning. Our more optimistic hope is that due to this report there will be many new actors emerging in the playground of European higher education who want to experiment with the new technology and believe in blended learning.

Project and Partners Information

B-Learn - Assisting teachers of traditional universities in designing blended learning
225565-CP-1-2005-1-EE-MINERVA-M
The project is carried out with the financial support of the European Commission (Socrates Minerva programme) and considerable contribution from all the partners

Starting date: October 01, 2005
Duration: 24 months

Project website
http://www.ut.ee/blearn

B-learn Trac-Wiki
http://trac.htk.tlu.ee/blearn

Contact B-Learn team
teadus.blearn.info@lists.ut.ee

[coordinator]

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http://www.helsinki.fi/palmenia
Jyri Manninen, jyri.manninen@helsinki.fi

UPorto - University of Porto (Portugal)
Faculty of Engineering, Information and Multimedia Communications Technologies Unit
http://www.fe.up.pt
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Carlos Oliveira, colive@fe.up.pt

TU - University of Tallinn (Estonia)
Centre for Educational Technology
http://www.htk.tlu.ee
Mart Laanpere, martl@tpu.ee

HSH - Stord/Haugesund University College (Norway)
ICT in Education repr. NITOL group (Norway-net with IT for Open Learning)
http://www.hsh.no/nitol
Harald Haugen, harald.haugen@hsh.no
Bodil Ask, bodil.ask@hia.no
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KTU - Kaunas University of Technology (Lithuania)
Distance Education Centre
http://distance.ktu.lt/en
Danguole Rutkauskiene, danguole.rutkauskiene@ktu.lt

EDEN - European Distance and E-Learning Network (United Kingdom)
http://www.eden-online.org
Ildiko Mazar, mazar@eden-online.org
Andras Szucs, secretariat@eden-online.org

Appendix

Author	Title	Year	Publication	Vol	Pages	Abstract
	E-Learning Resources. Blended Learning		http://www.grayharriman.com/blended_learning.htm#			
	What Works in enterprise learning and talent management?					A wide variety of research and tools to help you build high-impact blended programs.
	Training Reference					Blended learning home page. Here you'll find: * New projects & case studies * General news * Research, studies and reports * Articles * Books * Supplier information
	Enhancing College / SME Blended Learning Networks					ECOSME (Enhancing College/SME Blended Learning Networks) is an ESF Objective 3 project, launched in 2004, with the intent of achieving better practice in college-supported education and training in Small and Medium sized Enterprise (SMEs). The study, led by Glenrothes College, encompasses the work of SFEU, Learndirect Scotland and ten of ScotlandsColleges, helping to ensure that SMEs benefit from the potential of e-Learning and blended learning.
Alison Davies, Jill Ramsay, Helen Lindfield and John Couperthwaite	A blended approach to learning: added value and lessons learnt from students' use of computer-based materials for neurological analysis	2005	British Journal of Educational Technology	36	839-	This paper examines BSc Physiotherapy students' experiences of developing their neurological observational and analytical skills using a blend of traditional classroom activities and computer-based materials at the University of Birmingham. New teaching and learning resources were developed and supported in the School of Health Sciences using Web Course Tools combined with a wide range of video clips of patients with neurological disorders on CD-ROM. These resources provided students with the opportunity to observe "real patients" prior to clinical placements, thus bridging the gap between their theoretical understanding of these disorders and their practical experience of evaluating abnormal movement in the clinical setting.

						This paper considers how this blended approach to learning enhanced students' experiences of developing their neurological skills and of preparing for their clinical placements. This paper also discusses the lessons that have been gained from students' experiences to provide future or similar projects with the opportunity to learn from these experiences.
Allison Rossett, Felicia Douglis, and Rebecca V. Frazee	Strategies for Building Blended Learning	2003				At a recent conference, a practitioner was overheard saying, I can see why blending makes sense. But what do I put with what? We have a hundred instructors and e-learning modules. If I put them together, is that a blend? What is a blend and how do I make it work in an organization that prefers a quick fix? Those questions and more are tackled in this article. Blending a course is another method for moving towards the concerted systems thats essential to learning and performance. Blends are characterized by customization, integration, purpose, flexibility, and redundancy. The alternativeone-size-fits-allis no way to serve a global workforce. The author gives number of tips of "how to blend" (for ex. what methods to use, how to communicate, etc).
Alonso, Fernando , Genoveva Lopez, Daniel Manrique and Jos Vies	An instructional model for web-based e-learning education with a blended learning process approach	2005	British Journal of Educational Technology	36	217-235	Web-based e-learning education research and development now focuses on the inclusion of new technological features and the exploration of software standards. However, far less effort is going into finding solutions to psychopedagogical problems in this new educational category. This paper proposes a psychopedagogical instructional model based on content structure, the latest research into information processing psychology and social contructivism, and defines a blended approach to the learning process. Technologically speaking, the instructional model is supported by learning objects, a concept inherited from the object-oriented paradigm.

Alvin Hwang, J. B. Arbaugh	Virtual and Traditional Feedback-Seeking Behaviors: Underlying Competitive Attitudes and Consequent Grade Performance	2006	Decision Sciences Journal of Innovative Education	4	1-	The electronic medium continues to play an increasingly important role in the delivery of management education despite a paucity of empirical studies on its impact and efficacy. Results from a study of competitive attitudes and feedback-seeking behaviors across seven "hybrid" electronic cum live classes showed that Kiasu-Negative (a competitive attitude directed at preventing others from getting ahead of oneself) and Kiasu-Positive (a competitive attitude directed at personal diligence to get ahead of others) (Hwang, Ang, & Francesco, 2002) were related to two electronic discussion board feedback-seeking behaviors. These feedback-seeking behaviors, in turn, were related to grade performance as measured by multiple-choice tests. Traditional feedback-seeking measures of asking the professor in class or outside the class, and checking with fellow students for their views on class topics did not have a positive influence on multiple-choice test performance. In light of these findings, educators should consider how best to encourage participation on electronic discussion boards for hybrid type courses, while researchers should further examine the underlying causes of learning from such electronic exchanges. Other implications of these findings are also discussed.
Anita Pincas	Gradual and Simple Changes to Incorporate ICT into the Classroom	2003	www. elearning europa.com			computer-based delivery is expanding the continuum of learning environments, especially the blended courses. Since many campus-based instructors are sceptical of wholesale shifts, this short paper suggests gradual and simple changes to lighten the new instructors ICT learning load and improve student learning. The article is based in the Online Education and Training (OET) course from the Institute of Education, University of London.
Aspden, Liz; Helm, Paul	Making the Connection in a Blended Learning Environment	2004	Educational Media International	41	245-252	The presence of a virtual learning environment (VLE) in an on-campus setting can alter the dimensions of existing learning and teaching

						relationships. Research literature indicates that increased engagement with educational technology can have the effect of drawing staff and students closer together (both physically and virtually) rather than encouraging campus-based institutions to deliver more of their provision at a distance. This paper will explore how on-campus students can benefit from appropriate use of technology in ways that make them feel increasingly connected with their institution and their peers. Using qualitative data we explore how effective use of technology can help to bridge the physical gap between the students, their institution and their peers--even where the actual interactions between students take place offline--and how the combination of physical and virtual learning environments can be used to create an effective learning and teaching experience.
Australian National Training Authority	Learning Technologies. Blended learning	2003				The following material resulted from an ANTA-funded project which set out to investigate blended learning through a series of interviews with teachers. Interviewees were encouraged to reflect on their blending practices and on what they'd learnt along the way. In every case the teachers quoted are out there doing it, exploring how they can take advantage of the possibilities of computers and the Internet. Step-by-step Handbook (containing 4 booklets) on how to plan blended learning.
Bersin & Associates	Blended Learning: What Works?					After nearly 2 years of research in blended learning, and detailed interviews with more than 30 companies, we find that blended learning is replacing e-learning as the next big thing. Our research finds that blended learning programs are perhaps the highest impact, lowest cost way to drive major corporate initiatives. Companies have discovered unique and powerful methodologies for selecting the right media to solve a given business problem. The biggest challenges companies face include

						technology and the change management and business processes required to roll out major programs. Results: Blended Learning solves the problem of speed, scale, and impact and leverages e-learning where its most appropriate, without forcing e-learning into places it does not fit.
Bersin, Josh	The Blended Learning Book: Best Practices, Proven Methodologies and Lessons Learned	2004	San Francisco, California. Pfeiffer			The book focus on the corporate training marked. Blended learning is the latest step in a long history of technology-based training. In the context of this book, blended learning programs use many different forms of e-learning, perhaps complemented with instructor-led training and other live formats. The book defines blended learning as the combination of different training media (technologies, activities and types of events) to create an optimum training program for a specific audience.
Bjarnø, Vibeke	Information and communication technology in teacher education - Adapted learning carried out by blended learning.	2005	HiO-rapport : New teaching and learning practices: experiences with eLearning projects at Oslo University College 1998-2005. Oslo University College, Faculty of Education.			There was a need to close the gap between the teachers ICT knowledge and their ability to use it to enhance learning. Integrating ICT in all disciplines seemed to be a good solution to achieve this goal. Oslo University College wanted to see how they could make the students more competent to use ICT in their teaching situation and teach them how to integrate ICT as a tool for supporting learning processes as teachers. The students had ICT skills but need examples how to integrate it in their teaching. To do this The ICT department started to help lecturers at the college to integrate ICT in their different disciplines instead of focusing on separate ICT courses. In the first year there was an increase on 21% on the students answering that the ICT integration in lessons and supervision in other disciplines were useful for the learning process.

Boeker, M; Klar, R	[E-learning in the education and training of physicians. Methods, results, evaluation]	2006	Bundesgesundheitsblatt, Gesundheitsforschung, Gesundheitsschutz	49	405-411	E-learning has been established in the education and training of physicians in various types: linear sequential and hyper-textual forms of multimedia presentations and texts, tutorial systems and simulations. Case-based e-learning systems are of special importance in medicine because they allow for mediation of process and practical knowledge by presentation of authentic medical cases in a simulated environment. The integration into the medical education and advanced professional training is crucial for the long-term success of e-learning; in case-based systems this can be accomplished by blended learning approaches which combine elements of traditional teaching with e-learning. Learning management systems (LMS) support integration of traditional teaching and e-learning by serving as an organizational platform for content of teaching. Further, they provide means of communication for trainers and trainees, authoring tools, interactive components, course management and role-based sharing concept. The dissemination of e-learning can be fostered by attention to requirements and user analysis, early adoption to organizational structures, curricular integration and continuous cooperation with students. Summarized, didactic and organizational aspects determine the success of our own e-learning offers as well as they influence the general further development of e-learning more than technical features.
BOYLE, TOM	A Dynamic, Systematic Method for Developing Blended Learning	2005	Education, Communication & Information,	5	221-232	The focus of this paper is how to improve a course using a blended learning approach. The paper advocates a methodology that is pedagogically driven. The nature of the blend is determined by an analysis of the range and nature of the problems faced by learners. The components and relationships in the blend are developed to tackle these problems systematically to produce an overall solution that makes a

						measurable impact on student performance. The methodology is illustrated by a major case study where a marked impact on student performance was demonstrated. The paper concludes by discussing how better conceptual representation can underpin the evolution of more powerful methodologies for blended learning development.
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Bunderson, C Victor	Four Frameworks for Viewing Blending Learning Cases: Comments and Critique.	2003	Quarterly Review of Distance Education	4	279-288	Presents a critique of the five case studies of blended learning environments in this issue. Comments are organized around the following four frameworks: (1) the J-curve of implementation; (2) the theory of Engaged Collaborative Discourse; (3) adaptation to individual differences; and (4) Validity-Centered Design.
Burgon, Holli; Williams, David D	Case 3: Bringing Off-Campus Students on Campus: An Evaluation of a Blended Course.	2003	Quarterly Review of Distance Education	4	253-260	Describes an undergraduate religion course at Brigham Young University (Utah) in which seven learners pursuing an online baccalaureate degree were invited to join 49 on-campus students. This case study presents an evaluation of the course based on interviews with distant learners, on-campus students, and instructors.

Caroline Gray	Blended Learning: Why Everything Old Is New AgainBut Better					Blended learning is a powerful training solution that combines e-learning with a variety of other delivery methods for a superior learning experience. This article reveals what makes blended learning so powerful, and how to choose the right mix of delivery methods for the best blend of skill enhancement and sustainability to ensure a companys long-term competitive advantage.
Christensen, Trudy K	Case 1: Finding the Balance: Constructivist Pedagogy in a Blended Course.	2003	Quarterly Review of Distance Education	4	235-243	Describes a blended introductory instructional design course at Brigham Young University (Utah) that was evaluated, revised, and re-evaluated. The case is an example of how a faculty member teaching a blended course must constantly determine the balance between face-to-face and online components.
Cottrell, David M; Robison, Reid A	Case 4: Blended Learning in an Accounting Course.	2003	Quarterly Review of Distance Education	4	261-269	Describes a large-enrollment accounting course at Brigham Young University (Utah). This case focuses on the possibility of using blended approaches to reduce faculty time, re-focus student time, and raise the possibility of using blended learning as a way to admit more students to an academic program
D. Randy Garrison, Heather Kanuka	Blended learning: Uncovering its transformative potential in higher education	2004	The Internet and Higher Education	7	95-105	The purpose of this paper is to provide a discussion of the transformative potential of blended learning in the context of the challenges facing higher education. Based upon a description of blended learning, its potential to support deep and meaningful learning is discussed. From here, a shift to the need to rethink and restructure the learning experience occurs and its transformative potential is analyzed. Finally, administrative and leadership issues are addressed and the outline of an action plan to implement blended learning approaches is presented. The conclusion is that blended learning is consistent with the values of traditional higher education institutions and has the proven potential to enhance both the effectiveness and efficiency of meaningful learning experiences.

Danchak, Michael M, Huguet, Marie-Pierre	Designing for the Changing Role of the Instructor in Blended Learning.	2004	IEEE Transactions on Professional Communication	47	200-210	This paper is an analysis of the challenges of dealing with the human and technical aspects of blended learning. It presents a case study of how one course has evolved over the years, presenting not only the lessons learned and the changes made at each stage, but the rationale for those changes. Looking at learning as the combination of information and interaction, the paper describes how the instructor went from being the Sage on the Stage to being the Sage in the Cage, to being the Guide on the Slide, to finally being the Guide on the Side. It also documents how the course went from being technology driven to learner driven, and the evolution of an activity cycle. The paper ends with a rationale for design changes and implications for current and future designs
Denis, B.	A conceptual framework to design and support self-directed learning in a blended learning program. A case study: the DES-TEF	2003	Journal of Educational Media	28	2-3	This paper relates different strategies developed in order to supportthe learning process in a learning programme involving adults from different backgrounds who are interested in the use of Information and Communication Technologies for Education. Referring to Carr and Pearn´s model of the seven pillars of self-learning, the author describes some principles, tools and resources that have been developed within the framework of a postgraduate diploma and that could be extended to similar adult training programmes.
Denis, B. & Piette, S-A.	Regulation of training system for adults in educational technology.	2003	G.Davies & E.Stacey (Eds). Quality Education @ a Distance.		221-230	This paper reports the characteristics of a post graduate diploma on educational technologies based on a combination of face-to-face and distance activities and assesses its quality.
Derntl, Michael and Renate Motschnig-Pitrik	Patterns for Blended, Person-Centered Learning: Strategy, Concepts, Experiences, and Evaluation	2004	ACM Symposium on Applied Computing			Within the last few years, e-learning has become a focal point in several universities and organizations. While much research has been devoted to producing e-content, describing it with metadata, and to constructing e-learning platforms, less attention has been paid to

						using technology to improve the learning process in terms of depth and scope. Our research is targeted at filling this gap by considering learning support from a technical as well as sociopsychological perspective. We investigate how these two worlds can be brought together to result in maximum cross-fertilization. In this paper we focus on conceptual modeling of successful blended learning processes, their semi-formal description as patterns, and on the use of patterns as sources for the derivation of web-based templates. We report on experiences and evaluations of employing patterns in the context of blended, Person-Centered learning in technical subjects. Our major conclusion is that blended learning has added value only if designed thoughtfully and accompanied by high interpersonal skills of instructors.
Derntl, Michael, Motschnig-Pitrik, Renate	The role of structure, patterns, and people in blended learning.	2005	Internet & Higher Education	8	111-130	Recently, much e-learning research has been devoted to producing e-content, describing it with metadata, and to constructing e-learning systems. Considerably less attention has been paid to integrating technology to improve the learning process in terms of depth and scope. In this paper, that gap is filled by considering learning support from a technological as well as from a socio-psychological perspective. Didactically, well-proven educational principles from the Person-Centered Approach are adopted to drive educational processes. Technically, a layered framework for deriving Web-based support from these educational principles is proposed. The study focuses on the contribution of visual modeling of blended learning scenarios, on their semi-formal description as patterns, and on the use of patterns as sources for user-centered Web support modules. The experiences and evaluations of one major academic course on Web Engineering indicate that blended learning has added value only when facilitated by educators with high interpersonal

Dodero, Juan Manuel , Camino Fernindez, and Daniel Sanz	An Experience on Students Participation in Blended vs. Online Styles of Learning	2003	inroads The SIGCSE Bulletin	34		This work compares two learning experiences developed with different styles during an academic semester in two universities. The objective of the study has been to test the advantages of the blended style of learning, in terms of students' participation and initiative in the learning process, compared with those of pure virtual e-learning. The study shows how information technologies act as an incentive to improve students' participation during traditional classroomlocated teaching, but do not help to increase their participation when the learning process is completely virtual and not complemented by regular classes.
Donald Clark	Blended Learning and Blended Learning in Practice	2005				We have seen how blended learning is not new. What is new is the sheer range of possible components in a blend. We must decide, through selected criteria, how these components should be blended to produce fruitful blends. People hold on to the familiar. This is sometimes what draws them towards blended learning. Vendors of elearning have been at fault in presenting build it and they will come models based on large catalogues of content and an LMS. Attention to motivation and people was rare. On the other hand cultural inertia, the reactive, protective attitude that resists change is also common. It is equally as destructive. Blended learning is an attempt to rise above these crude positions. In designing, developing and delivering different types of blends - component, integrated, collaborative or expansive - we must be sure that we have thought about the learning outcomes, learners, culture, learning resources, electronic infrastructure, scalability and maintainability of the proposed solution. Increasing choice is not an end in itself. Good cocktails are not normally made by including as many different drinks as you can muster. They are carefully crafted blends of complementary tastes, where the sum is greater than the parts.

						In some cases, as with whisky, a single malt is superior to the blend!
Eilif Trondsen	Use of Technology in Leadership Development	2006				The research confirms that technology has low use today in most organizations' leadership-development programs. Evidence points to growing use, but we cannot expect quick and dramatic change, because rapidly changing technology does not necessarily imply accelerating adoption unless the culture is conducive to technology use. But a number of driving forces that the report discusses are likely to boost the adoption of technology in leadership-development programs: 1)Leadership portals: Providing a range of learning tools and resources. 2)Simulations for interactive, experiential learning: Virtual, hands-on learning experiences and team-based simulations, often in blended formats combining computer- and classroom-based delivery. 3) Rich media content: video players on the Internet open the opportunities for use in formal and informal learning programs for executives and managers. As technology becomes more user-friendly and easier to use technology will find new applications in leadership development.
Ellis, R.A, Goodyear, P, Prosser, M, O'Hara, A.	How and what university students learn through online and face-to-face discussion: conceptions, intentions and approaches.	2006	Journal of Computer Assisted Learning	22	244-256	This paper reports a phenomenographic investigation into students' experiences of learning through discussion both online and face to face (F2F). The study context was a second-year undergraduate course in psychology for social work in which the teacher had designed discussion tasks to begin in F2F mode and to continue online. A combination of open-ended questionnaires and semi-structured interviews was used to investigate students' conceptions of what they were learning, their intentions and their approaches to learning through discussion. Analysis of the interview and open-ended questionnaire data identified a number of qualitatively different conceptions, intentions and approaches to learning through discussion.

						Associations were found between what students thought they were learning through discussions, their approaches to learning through discussion and their course grade. Students with a cohesive conception and students adopting a deep approach (to learning through online discussion) got better course grades. There was no significant difference between deep and surface approaches to F2F discussion and course grade. The outcomes of this study have implications for the design of online and F2F discussion tasks and in particular for helping students adopt richer conceptions of what they stand to gain through discussion.
Fiona Concannon, Antoinette Flynn and Mark Campbell	What campus-based students think about the quality and benefits of e-learning	2005	British Journal of Educational Technology	36	501-512	There is a trend in Irish universities to utilise the benefits of the e-learning as a mechanism to improve learning performance of campus-based students. Whilst traditional methods, such as face-to-face lectures, tutorials, and mentoring, remain dominant in the educational sector, universities are investing heavily in learning technologies, to facilitate improvements with respect to the quality of learning. The technology to support reuse and sharing of educational resources, or learning objects, is becoming more stable, with interoperability standards maturing. However, debate has raged about what constitutes effective use of learning technology. This research expands upon a study carried out in 2003 examining students' perceptions of e-learning in a large undergraduate accounting class environment. As a result, improvements were made to the instructional design of the course, to enable students to engage interactively with content. The subsequent study, reported in this paper, adopted a broad range of techniques to understand students' learning experience in depth. The findings of this research provide an insight into how these students really work and learn using technologies, if at all. It is hoped that our

						findings will improve the experience for both students and lecturers who engage in teaching and learning through this medium.
Fitzgibbon, Karen,Jones, Norah	Jumping the hurdles: challenges of staff development delivered in a blended learning environment.	2004	Journal of Educational Media	29	25-35	When the University of Glamorgan embarked upon an ambitious e-learning development project, it quickly became clear that before teaching online, academic staff would need a training programme, which could introduce them to the pedagogy associated with this very different form of teaching and learning. This paper addresses the challenges for the staff development process when delivered in a blended learning environment. The paper is presented in three sections, the first outlines the development process of an e-learning initiative, the second examines the model of teaching and learning, and the final section outlines the challenges to change encountered along the way. The paper concludes that a blended learning environment lends itself well to staff development for e-learning initiatives. The authors also explore future developments including further module and course development inspired by this successful model.
Gary Motteram	'Blended' education and the transformation of teachers: a long-term case study in postgraduate UK Higher Education	2006	British Journal of Educational Technology	37	17-	This paper discusses the role of blended learning in teacher education on a Master's programme at Manchester University. Blended learning is the bringing together of traditional physical classes with elements of virtual education. The paper focuses on one particular module of the degree and attempts to capture students' experiences of using a number of online tools. As our students are primarily in-service teachers, this experience is particularly relevant and equips them to make use of educational technology in the language classroom. Some comparisons are also made with a cohort of teachers studying the programme at a distance. The paper explores a range of issues that currently feature in the adult education literature, namely, deep and surface learning, communities

						of practice, and the importance of educational dialogue. The paper illustrates how important the blended nature of this module is for the teachers to get a balanced programme that upgrades skills and knowledge, but which also enables them to reflect on past and future practice. A transformative education scale is used to show that teachers can be transformed. The paper is a case study that makes use of data that explore the student perspective on a series of research questions.
Gerard Prendergast	Blended Collaborative Learning: : Online Teaching of Online Educators	2004	GlobalEducator			Blended Collaborative Learning is essentially a tutor-led distance learning method that blends available face-toface and online techniques on a foundation framework of facilitated asynchronous conferencing. Blended Collaborative Learning actively encourages the modern form of 'communities of practice' and permits dispersed individuals to contribute and gain from this kind of group involvement. By embedding human interaction in learning programmes, the online educator exploits the human need for socialisation to aid learning through blending face-to-face experiences with synchronous online tools, asynchronous online methods and even Computer Based Training knowledge objects in an appropriate mix. In this article, the author explores the advantages and disadvantages of using online learning environments to teach academic staff about teaching online and so shares his considerable experience in online education to suggest practical techniques for the online teaching of future online educators and in the process, creating effective blended collaborative learning educators.
Glenda Cox, Tony Carr & Martin Hall	Evaluating the use of synchronous communication in two blended courses	2004	Journal of Computer Assisted Learning	20	183-	Residential universities are increasingly integrating online interaction within courses in the form of synchronous online chats, asynchronous online discussions and access to interactive resources. This article evaluates the educational effectiveness of online chats within a

						Humanities postgraduate course and a final year Commerce course. We consider the roles of course design, group dynamics, and facilitation style in the successful use of online collaboration within primarily face-to-face courses, as well as the potential for online collaboration within a blended course design to facilitate more inclusive learning conversations than are possible with exclusively face-to-face interaction.
Guldberg, K; Pilkington, R	A Community of Practice Approach to the Development of Non-Traditional Learners through Networked Learning	2006	Journal of Computer Assisted Learning	22	159-171	This paper analyses a sample of online discussions to evaluate the development of adult learners as reflective practitioners within a networked learning community. The context for our study is a blended learning course offering post-experience professional training to non-traditional university students. These students are parents and carers of people with autistic spectrum disorder (ASD). We use Lave and Wenger's "communities of practice" as a theoretical framework for establishing how students develop a learning community based upon mutual engagement, joint enterprise and shared repertoires. Those three aspects are analysed according to two measures. The first focuses on learner appropriation of the professional discourse, values and goals of the ASD carer through the network. The second relates to changes in the quality of collaborative activity over time. Our analysis demonstrates that students belong to an overarching community of practice, with different subsets who work at sharing and co-constructing common understandings. This shared discourse and common notions of what constitutes good practice help create a safe interaction space for the students. Once group identity is consolidated, more challenging questions emerge and the group are able to define further common values, understandings and goals through processes of resolution.

Gynther, Karsten	Blended learning : IT og læring i et teoretisk og praktisk perspektiv	2005	Kjøbenhavn : Unge Pædagoger			Looks at how to implement blended learning in teaching situations based on a research project for teacher students at a traditional University College in Denmark.
Harold W. Webb, Grandon Gill and Gary Poe	Teaching with the Case Method Online: Pure Versus Hybrid Approaches	2005	Decision Sciences Journal of Innovative Education	3	223-	The impact of hybrid classroom/distance education approaches is examined in the context of the case method. Four distinct semester-long treatments, which varied mixes of classroom and online discussion, were used to teach a graduate MIS survey course. Specific findings suggest that by using Web technology, college instructors may offer students the option of participating in high-quality courses using the case method pedagogy in an online environment. Students not only appear to do as well as in the traditional classroom, but the data suggest that students in the online environment may perform better at multiple levels of learning outcomes, especially when using a blend of classroom and online technologies. Furthermore, the precepts of the case method pedagogy may be enhanced by the use of online discussions. Instructors employing the technique may find their own importance devalued, while the time demands of the approach can be much greater than for traditional classes. The findings infer that it is the model of learning and its fit with supporting technologies, rather than the presence of technology per se, which enhances learning outcomes.
Hiltz, Starr Roxanne, Turoff, Murray	EDUCATION GOES DIGITAL: The Evolution of Online Learning and the Revolution in Higher Education.	2005	Communications of the ACM	48	59-64	The article presents a discussion on the evolution of online learning and the revolution in higher education. Online learning is the latest in a long list of social technologies that have been introduced to improve distance learning by adding various augmentations, substitutions, or blending of new pedagogical approaches and technologies. Online learning is revolutionizing higher education both as process and social institution.

						It is a new social process that is beginning to act as a complete substitute for both distance learning and the traditional face-to-face class. This is because it also is a process that will infiltrate the ordinary face-to-face class and radically change the nature of what is thought of as the typical college course. Face-to-face courses skillfully blended with online learning technologies and methodologies are generally rated by students as significant improvements over traditional face-to-face classes. The pace of this change depends upon many social factors; it may take 10 years or it may take far longer. Countervailing forces might take the form of resistance or an entirely new conception of the role of education in society.
Hofmann. Jennifer	Blended Learning Case Study. Available at:	2001	http://www.learningcircuits.org/2001/apr2001/			Proposes that 'the idea behind blended learning is that instructional designers review a learning program, chunk it into modules, and determine the best medium to deliver those modules to the learner'.
J. Pearson & S. Trinidad	OLES: an instrument for refining the design of e-learning environments	2005	Journal of Computer Assisted Learning	21	396	Abstract Designing and implementing effective e-learning is a complex process, which involves many factors. Lecturers need to constantly consider, evaluate and adjust these factors to provide effective e-learning environments for students. In this paper, we report on the design and development of the Online Learning Environment Survey (OLES), an instrument which can be used to gather and represent data on students' 'actual' (experienced) and 'preferred' (ideal) learning environments. We describe the use of this instrument in blended learning environments with university classes, illustrating how OLES can be used by educators striving for good practice in the design of effective online learning environments.
Jared M. Carman	blended learning design: five key ingredients	2002				The author argues that all the humans are blended learners - there just has the right balance to be found.

						Author suggest five elements for blended learning process as the key ingedients of blended learning in business-case. These five are: 1) live events, self-paced learning, collaboration, assessment and performance support materials.
Jeanine Romano, Tary L. Wallace, Ina J. Helmick, Lou M. Carey and Lisa Adkins	Study procrastination, achievement, and academic motivation in web-based and blended distance learning	2005	The Internet and Higher Education	8	299-305	Growth in distance education is increasing the need to examine students' learning strategies in distance and blended learning environments. Students' cramming or spaced-review behaviors were measured and compared across delivery formats as well as examined related to course achievement and attitudes across a term. Although theory would predict that spaced study rather than last minute cramming would yield higher achievement, researchers report mixed findings in both areas. One hundred fifty-seven students in distance and blended course formats were blocked into 5 groups based on their cramming/spaced-review patterns a week prior to each of 3 posttests. Significant differences were observed in cramming/spaced-review behaviors between delivery formats and for achievement and attitudes.
Jelfs, Anne; Nathan, Roberta; Barrett, Clive	Scaffolding Students: Suggestions on How to Equip Students with the Necessary Study Skills for Studying in a Blended Learning Environment	2004	Journal of Educational Media	29	85-96	In this paper we consider the implications of moving from a paper-based delivery of study support materials to electronic delivery. The paper is based on telephone interviews with 60 students who had received a range of study support materials from a series of 'student toolkits', which are printed resource booklets for students of the UK Open University. McLoughlin (2002) sees the integration of electronic delivery at the primary, secondary and tertiary education levels as requiring an extension to current concepts of scaffolding. The extension we propose in this paper is the need to establish study skills plus the ways and means to seek support in a resource-based environment. However, there is a delicate balance between increased provision and overloaded provision in resource-based learning.

Joergen Bang	eLearning reconsidered. Have e-learning and virtual universities met the expectations?					Article will focus on the development of virtual universities and discuss some reasons for the lack of success. The difficulties faced by many of the e-learning and online learning initiatives have been caused by viewing learning, and especially e-learning, as a process of knowledge transfer instead of knowledge construction - too much emphasis has been placed on the concept of stand-alone courses and resource-based learning. Author argues that the liability for successful blending will lie on teachers and tutors as the organisers of the learning process.
Joke Voogt, Marinus Almekinders, Jan van den Akker and Bert Moonen	Blended in-service arrangement for classroom technology integration: impacts on teachers and students	2004	Computers in Human Behavior	21	523-539	Many studies report that the implementation of technology in education is a complex innovation. Particularly teachers lack skills to integrate technology in their instructional processes. Therefore the potential of technology in the classroom is hardly realized. Teacher learning on classroom use of technology is considered important. In this contribution “blended” in-service arrangement to support secondary school teachers in the integration of technology in their classroom is presented. The arrangement consisted of workshops, exemplary curriculum materials and computer mediated communication. The article describes and discusses two studies that applied and evaluated the blended approach to teacher professional development. The results of both studies show that this seems a promising arrangement for supporting the integration of technology in education. However, realizing the potential of technology to create communities of practice remains difficult because for most teachers this use of technology is yet not congruent with their daily routines.
Josh Bersin	What Works in Blended Learning	2003	Learning Circuits			Blended learning is the latest buzzword in corporate training. It sounds so simple: mix e-learning with other types of training delivery. But questions persist.

						What are the best ways to blend delivery types? When do you blend? What blends work best with what? And the $million question: Will the term blended learning replace e-learning? Bersin & Associates set out to understand these issues. In 2002 and 2003, Bersin & Associates partnered with IDC to conduct a study of more than 30 corporate blended learning programs to understand what works. The biggest conclusions were that blended learning can be most cost-effective way of delivery, moreever BL is a good tool to force companies to calculate the processes and costs carefully. Bersin puts forward five success-elements of BL: large scale audience, speed of delivery, effective throughput, complexity of the curricula, optimized cost. Authors argue that BL is effectively replacing e-learning. Its simply the natural evolution of e-learning into an integrated program of multimedia applied toward a business problem in an optimum way.
Kennedy, David M	Standards for online teaching: lessons from the education, health and IT sectors.	2005	Nurse education today	25	23-30	Online teaching is a growing, but not a new, phenomenon. It is most associated with distance education, but it also features in classroom education, in the form of blended learning. During this period of growth in online teaching, there has been time for the development of standards to ensure its quality. Yet the standards that have emerged tend to be derivatives of the standards for conventional, classroom teaching. They do not adequately address the specific demands of online education. Is this acceptable for online teachers? Is it supportive of online students? This contribution to the debate outlines how nurse educators can generate--and are generating--credible standards for their online practice. It identifies flaws in the current guidance for online teachers. It points out that knowledge of standard setting in the health service can support standard setting in higher education. And it highlights that the most useful guidance for the online teacher comes not from the education sector but from the industrial sector, specifically from the IT

						industry. It finishes on a practical note, describing how nurse educators in the University of Paisley are using these findings to develop standards for their online teaching practice.
Kerres, M. & De Witt, C.	A Didactical Framework for the Design of Blended Learning Arrangements	2003	Journal of Educational Media	28	2-3	They discuss blended learning as a mix of different didactic methods and delivery formats. Their argumentation is based on the assumption that these two are independent of each other.
Kerry Shephard	Questioning, promoting and evaluating the use of streaming video to support student learning	2003	British Journal of Educational Technology	34	295-	This paper uses case studies to describe how streaming video is currently used to support student learning in post compulsory education in the UK. It describes the current role of streaming video and identifies processes that could extend the application of streaming in education. It attempts to establish a case for more formal evaluation and communication of educa-tional processes involving streaming and identifies elements of a research agenda that could further develop the application of streaming technology in education.
Klein, James D., Michael Spector, Barbara Grabowski, Ileana de la Teja	Instructor competencies Standards for face-to-face, online, and blended settings	2004	Greenwich. IAP Information Age Publishing			This book is written by four persons in The International Board of Standards for Training, Performance and Instruction (ibstpi). The mission of ibstpi is to develop. Validate and promote the implementation of international standards to advance training, instruction, learning and performance improvement for individuals and organizations.
Lanham, Elicia; Zhou, Wanlei	Cultural Issues in Online Learning-Is Blended Learning a Possible Solution?	2003	International Journal of Computer Processing of Oriental Languages	16	275-292	The emergence of cross-cultural classrooms has been steadily increasing in Australian tertiary institutions, due to the growing population of international students enrolling to complete their degrees. This increase in international students has signified a change in the student demographics, thus recognizing the differences in students' learning styles, & indicating that a more flexible approach is needed for learner content delivery. Research has suggested that students from different cultures have varying

						compatibility with different learning environments. With tertiary institutions now expanding towards the online forum for delivery of units, these compatibilities of students are even more evident. Hence, in order to ensure that all students are able to participate in this domain, preparations are needed to accommodate all cultural types. Therefore, with the emphasis on creating flexible learning environments for all students, the blended learning approach has been suggested as a solution.
Linda Creanor, Steve Walker	Trade Union Use of ICT to Support Learning	2005	www.elearningeuropa.info			Six case studies were conducted between June and October 2004 along with an online survey. There are five national case studies from Italy (Confederazione Italiana Sindicati Lavoratori), Germany (Deutscher Gewerkschaftsbund (DGB) Bildungswerk), the Netherlands (Federatie Nederlandse Vakbewegingen), Sweden (Landsorganisationen i Sverige) and the British (Trades Union Congress) and one transnational case study from the European Trade Union College (ETUCO). These cases illustrate some of the diverse ways in which trade unions are approaching the use of ICT to support formal and informal learning, vocational and trade union training, blended learning, organisational and self-paced learning; and national and transnational learning. The case studies reveal a range of approaches towards the use of ICT in trade union learning which reflect a variety of organisational priorities and responses in particular national contexts. Differing industrial relations environments, union cultures, national government policies and initial experiences with ICT in learning are among the factors contributing to this diversity.
Mark Stubbs, Ian Martin, Lewis Endlar	The structuration of blended learning: putting holistic design principles into practice	2006	British Journal of Educational Technology	37	163-	This paper considers the challenges faced by those seeking to design effective blended learning. Using a 2-year case study involving cohorts of approximately 200 students, it demonstrates how Anthony Giddens' structuration theory can provide a metaframework for assisting educational designers in creating coherent blended learning experiences that reinforce intended learning outcomes. It calls for educational de-

						signers to be sensitive to both their audience and the unintended and unanticipated consequences of their actions and shows how a holistic annual review framework can reinforce or suppress emergent behaviour through unit development.
Mason, Robin	Guest Editorial Blended Learning	2005	Education, Communication & Information,	5	217-220	What exactly is blended in blended learning? Is it the technologies? The teaching methods? The learning experiences for the students? The locations of the learning events? In fact, any and all of these can be found in articles about blended learning. However, the most common understanding still seems to be the original notion, namely, that blended learning blends different delivery modes and, in particular, online and face-to-face teaching. There is no doubt that blended learning is an amorphous term which can in theory be applied to almost any learning situation. Perhaps it is useful to consider blended learning primarily as an approach to the design of learning interventions. These interventions will be a mix of learning media and methods with the aim of achieving specific learning outcomes.
McCafferty, Linda R; Desaulniers, Jennifer E	The revolution of blended training - The distributed instructor	2004	The Interservice/ Industry Training, Simulation and Education Conference (I/ITSEC); Simulation and Training: Transforming 21st Century Operations			E-learning, distance education, computer-based training, web-based training, and blended learning are some of the many terms used to describe providing education from afar. Since the availability and complexity of technology has increased, distance education evolved into blended learning; which, has now been revolutionized into distributed training. The reason for this trend in academia, industry, and military is because the distributed training model is cost effective, reduces training time, promotes continuous learning, and increases training availability, retention, and performance. The transition from the traditional classroom setting, to teaching students from a distance using a blend of technology media, has created many challenges for instructors. Distributed learners

						expectations are high; they desire interactivity, immediate feedback, and lasting learning. The new breed of instructors who must apply distributed training techniques need to adapt to this new environment. Most instructors do not have the knowledge and skills required to create a blended training experience that meets the expectations of distributed learners. The purpose of this paper is to provide the results of an extensive literature review and best practices research. It will define the responsibilities and provide recommendations for instructing a distributed course that blends the use of video teletraining, interactive multimedia instruction, also known as computer-based training, and web-based training media. A qualitative analysis of the available information on blended training was undertaken to determine recurring themes, or best practices, using each of the three media delivery techniques. From this study the following five tasks emerged: prepare to deliver training, present content, facilitate interaction, provide feedback, and perform administrative functions. This paper will provide direction and guidance on the skills, knowledge, training, and resources needed for an instructor in academia, industry, or the military to effectively deliver blended distributed training.
Michael Brennan	Blended Learning and Business Change	2004	http://www.clomedia.com/content/templates/clo_article.asp?articleid=349&zoneid=13			Author of the article sets two lingering questions on the minds of those responsible for human performance:With all these training delivery methodologies at our disposal, how do we combine them effectively? How can we ensure that our investments in our training programs further our organizations success on an ongoing basis? Author suggests to consider background of the training, available resources, characteristics of the audience and characteristics of the content as the key-factors of the effective planning bof the BL As the obstacles for

						delivery of the BL author describes the following issues: study identified the following obstacles:Business objectives are not clearly articulated to those responsible for training, There is not clear enough ownership over most training initiatives; Trying to isolate the effects of training on business performance takes far too much time and too many resources to do effectively and credible; Compiling the necessary data is too difficult.
Michael McGinnis	Building a Successful Blended Learning Strategy	2005	http://www.ltimagazine.com/ltimagazine/article/articleDetail.jsp?id=167425			Author says: "There seems to be reluctance in transitioning instructor-led training (ILT) to a blended learning format. This may be due to resistance on the part of the organization or training department to change existing classroom session formats. Another reason I believe is more prevalent is not knowing how." The article consists of a case study of how company's training department made a very successful transition prior to knowing what blended learning meant. Article describes the procedure of developing a BL course.
Mihye Harker, Dmitra Koutsantoni	Can it be as effective? Distance versus blended learning in a web-based EAP programme	2005	ReCALL	17	197-216	This paper discusses the effectiveness of a web-based learning programme of English for Academic Purposes (EAP) for British students from ethnic minority backgrounds. Original web-based materials for English for Academic Purposes (EAP) were developed and 43 student volunteers participated in two different modes of learning during the 9-week long programme: through blended learning and at a distance. The study attempts to investigate which mode of delivery is more effective in terms of student retention, achievement levels and satisfaction with the programme. The study found that the blended learning mode was much more effective in student retention in this non-credit bearing programme, whilst studentsachievement levels were similar in both groups. In addition, formative and summative feedback from the students suggests that most students in both

						groups. In addition, formative and summative feedback from the students suggests that most students in both groups were satisfied with this web-based EAP programme
Motteram, Gary	"Blended" education and the transformation of teachers: a long-term case study in postgraduate UK Higher Education.	2006	British Journal of Educational Technology	vol 37	17-30	This paper discusses the role of blended learning in teacher education on a Master's programme at Manchester University. Blended learning is the bringing together of traditional physical classes with elements of virtual education. The paper focuses on one particular module of the degree and attempts to capture students experiences of using a number of online tools. As our students are primarily in-service teachers, this experience is particularly relevant and equips them to make use of educational technology in the language classroom. Some comparisons are also made with a cohort of teachers studying the programme at a distance. The paper explores a range of issues that currently feature in the adult education literature, namely, deep and surface learning, communities of practice, and the importance of educational dialogue. The paper illustrates how important the blended nature of this module is for the teachers to get a balanced programme that upgrades skills and knowledge, but which also enables them to reflect on past and future practice. A transformative education scale is used to show that teachers can be transformed. The paper is a case study that makes use of data that explore the student perspective on a series of research questions.
Nuckles, Matthias; Schwonke, Rolf; Berthold, Kirsten; Renkl, Alexander	The Use of Public Learning Diaries in Blended Learning	2004	Journal of Educational Media	29	49-66	Learning diaries--as we employ them--are students' written reflections of their learning experiences and outcomes over the course of university seminars. The writing of such diaries is 'tutored' by a computer program: eHELp supports the writing of sophisticated learning diaries through a modelling and scaffolding of the phases of planning, production and revision. In addition, the learning diaries get published- by

						uploading them in a cooperation platform -so that the learners can read and discuss their peers' diaries. The main function of such public learning diaries is to enrich traditional university courses (Blended Learning) with additional elaborative, organisational, critical reasoning, and metacognitive activities in order to foster a deeper processing and better retention of the contents to be learnt. Authors present the educational rationale of our approach and report the findings of corresponding empirical studies.
Oliver, Martin and Keith Trigwell	Can Blended Learning Be Redeemed?	2005	ELearning	2		Although the term blended learning is widely used, this article argues against it. Two arguments are advanced. The first is primarily philosophical, although it has several pragmatic implications. It proposes that blending either relies on the idea of dichotomies which are suspect within the context of learning with technology or else becomes ineffective as a discriminating concept and is thus without purpose. The implication of this is that the term blended should either be abandoned or, at the least, radically reconceived. The second argument proposes that learning, from the perspective of the learner, is rarely, if ever, the subject of blended learning. What is actually being addressed are forms of instruction, teaching, or at best, pedagogies. The implication of this is that the term learning should be abandoned. The second half of the article attempts to redeem the concept of blended learning by arguing that learning gains attributed to blended learning may have their explanation in variation theory. It offers a new way to conceptualise what is being blended that is theoretically coherent, philosophically defensible and pragmatically informative. The article concludes by setting an agenda for further work in this area.

Osguthorpe, Russell T; Graham, Charles R	Blended Learning Environments: Definitions and Directions.	2003	ELearning Quarterly Review of Distance Education	4	227-233	This discussion of blended learning environments covers: (1) background; (2) why the term "blended" is used, and what can be blended; (3) goals of blended learning environments, including pedagogical richness, access to knowledge, social interaction, personal agency, cost effectiveness, and ease of revision; and (4) characteristics of five case studies. Authors argue that there are six goals for educators for using blended courses: pedagogical richness, access to knowledge, social interaction, personal agency, cost effectiveness and ease of revision.
Peter, David M	Blended Learning--Best Educational Web Uses.	2002	ERIC, Resources in Education			Blended learning is much stronger when the Web is used to supplement instruction, rather than merely provide information to the students. This paper establishes a foundational knowledge base, where the stakeholders--technology coordinators, faculty, staff, and administrators--can make informed decisions on the role, importance, use, and educational validity of the Web in conjunction with traditional instruction. Discussion includes designing Web-based instruction; instructional issues; uses of the Web; Web content and the potential uses of the Web to deliver the content; and advantages and disadvantages of the Web.
Petra Neumeier	A closer look at blended learning - parameters for designing a blended learning environment for language teaching and learning.	2005		17	163-178	In the course of designing, writing and implementing CALL-supported material, it has become evident to me that a systematic investigation into the factors that shape the Blended Learning (BL) experience in the context of language learning and teaching is missing and urgently needed. The core question when designing a BL environment is: Which combination of modes provides the optimal basis for language learning and teaching given the particular conditions at hand? In order to tackle this question, course designers need a framework of parameters that help them decide on the individual, context-related implementation of BL. It is the purpose of this paper to put forward a defini-

						tion of BL and a framework of parameters for designing a BL environment. In order to achieve a better understanding of the factors that shape the practice and the experience of BL, the main parameters which form a BL environment will be listed and specified. These parameters evolved from the experience of designing Jobline LMU (www.jobline.lmu.de) and will hopefully prove to be helpful for the process of designing other BL environments. If applied successfully, the idea of BL could serve as a bridge between the broader community of language teachers and learners and CALL experts and practitioners. BL offers the potential of broadening the scope and influence of CALL and of (re-)establishing it as an innovative component of general language teaching.
Poole, Judith	E-learning and learning styles: students' reactions to web-based Language and Style at Blackpool and The Fylde College	2006	Language and Literature	15	307-320	The issue of learning styles and how they affect students' attitudes to pursuing online courses is a key issue for the development of web-based teaching. The focus of this article is how learning styles seem to have affected students' attitudes to undertaking the web-based Language and Style course at Blackpool and The Fylde College in 2004-5. The course was delivered in a blended format, incorporating both web-based and traditional teaching. The students' learning styles were assessed both at the onset and the end of the course. In this article I discuss students' reactions to the course and how these might be linked to the learning styles they exhibited at the time of the assessments. As a result of the investigation reported here, I suggest that an initial assessment of learning styles can be useful in predicting the kinds of web-based activities likely to prove valuable to the individual student. Potentially, this has consequences for the development of web-based and other learning materials in other subject areas

prof. dr. Betty Collis	Current Conditions ... in work and in organisations	2002				Betty Collis is a Shell Professor of Networked Learning University of Twente. This power point lists blended learning as one of three new ways of working and learning. The other two is: Reusable learning objects and Knowledge Sharing instead of Knowledge Management. Blended learning blends: 1) Different places and times where learning activities take place. 2) classroom and non-classroom process co-ordinated via a Web-based learning-support system. 3) the guidance and management of a capable instructor.
Purnima Valiathan	Blended Learning Models	2002				The term blended learning is used to describe a solution that combines several different delivery methods, such as collaboration software, Web-based courses, EPSS, and knowledge management practices. Blended learning also is used to describe learning that mixes various event-based activities, including face-to-face classrooms, live e-learning, and self-paced learning. Unfortunately, there's no single formula that guarantees learning, but here are some guidelines from NIIT on how to order your learning activities. The author describes different models of BL (1)skill-driven learning, which combines self-paced learning with instructor or facilitator support to develop specific knowledge and skills, 2) attitude-driven learning, which mixes various events and delivery media to develop specific behaviors; and 3) competency-driven learning, which blends performance support tools with knowledge management resources and mentoring to develop workplace competencies.
R. A. Ellis, P. Goodyear, M. Prosser & A. O'Hara	How and what university students learn through online and face-to-face discussion: conceptions, intentions and approaches	2006	Journal of Computer Assisted Learning	22	244-	This paper reports a phenomenographic investigation into students' experiences of learning through discussion both online and face to face (F2F). The study context was a second-year undergraduate course in psychology for social work in which the teacher had designed discussion tasks to begin in F2F mode and to con-

						tinue online. A combination of open-ended questionnaires and semi-structured interviews was used to investigate students' conceptions of what they were learning, their intentions and their approaches to learning through discussion. Analysis of the interview and open-ended questionnaire data identified a number of qualitatively different conceptions, intentions and approaches to learning through discussion. Associations were found between what students thought they were learning through discussions, their approaches to learning through discussion and their course grade. Students with a cohesive conception and students adopting a deep approach (to learning through online discussion) got better course grades. There was no significant difference between deep and surface approaches to F2F discussion and course grade. The outcomes of this study have implications for the design of online and F2F discussion tasks and in particular for helping students adopt richer conceptions of what they stand to gain through discussion.
Rae Condie and Kay Livingston	Blending online learning with traditional approaches: changing practices		British Journal of Educational Technology			Considerable claims have been made for the development of e-learning, either as stand-alone programmes or alongside more traditional approaches to teaching and learning, for students across school and tertiary education. National initiatives have improved the position of schools in terms of access to hardware and electronic networking, software and educational resources, and staff development. The potential of e-learning to improve learning and teaching, and in turn, attainment, may be contested by academics but the policy makers are generally positive. Many countries across Europe and North America have adopted information and communication technology (ICT) as a central plank in school improvement and effectiveness planning. At the centre, however, remain the teacher and the learner. The im-

						pact of ICT on the learning experience will depend upon the roles adopted by each, the model of the learner held by the teacher and the pedagogy adopted. This paper considers the ways in which teachers and students responded to the implementation of one particular online programme and considers the approaches adopted and the attitudes to its use. The SCHOLAR programme is designed to complement rather than replace traditional teaching and learning approaches within schools and is aimed at students in the post-compulsory years of secondary school working towards external certification. It has a number of features including course materials, revision exercises, self-assessment facilities and a discussion forum. The independent evaluation of SCHOLAR looked at the impact that its use made on learning and teaching in the post-16 classroom and the differing ways in which teachers and students used the various elements of the programme. While it did appear to have a positive impact on attainment, the evidence indicates that this might have been greater had the teachers modified their practice, blending learning through SCHOLAR with more traditional methods.
Rikke Schultz, Lone Guldbrandt Tønnesen	How can blended learning help to the integration of ICT in adult education?	2006				ICT opens up new possibilities in didactic thinking. While classroom teaching is a kind of mass-education designed for the average student, ICT opens up for real differentiation in content and working methods. Educational events can be organized in ways that appeal to individual needs and learning styles. For all this blended learning is a good way to get started. Author of the article describes the resistance factors to online learning (The curriculum tradition, The oral tradition, Lack of confidence in technical solutions to educational matters, Lack of experience with the media) and HEI's practical experience in how blended learning can bridge the gap between pedagogy and technology.

Rita Kupetz, Birgit Ziegenmeyer	Blended learning in a teacher training course: Integrated interactive e-learning and contact learning.	2005		17	179-196	The paper discusses a blended learning concept for a university teacher training course for prospective teachers of English. The concept aims at purposeful learning using different methods and activities, various traditional and electronic media, learning spaces covering contact and distance learning, and task-based learning modules that begin with multimedia-based case stories. The learning concept is based on theories of situated learning in multimedia-enhanced learning environments. The activities discussed include classroom recordings and multimedia-based case stories, an electronic interview with an expert who is an experienced grammar school teacher, and mini-practices, which implement micro teaching in a classroom setting. Case stories used as a didactic tool in teacher education are supposed to contribute to a closer and more reflective relationship between theory-driven and practically-oriented aspects of teacher education. The multimedia-based case stories are hypertexts designed as essential components of computer-based learning modules that support various ways and styles of learning. Students worked with the case story material either in guided or in self-regulated scenarios several times during the course. Three types of learners could be distinguished: students who mainly create and apply experiences, students who mainly study the theoretical resources, and students who create with focused selection of resources. The e-interview promotes an exchange between theory and practical teaching and experience with this format of e-learning at the same time. The mini-practice offers guided insights into analyzing teaching materials, hands-on experiences with lesson planning and the experience of acting as a teacher in an authentic teaching context. Furthermore, the mini-practice is meant to help the students broaden their per-

						spectives on English lessons at schooland change their perspective, that is, from a pupils to a prospective...
Roberts, Tim S	Towards a New Learning Paradigm?	2004	Information Management	17	26-28	It is a very interesting time to be involved in higher education. Two trends are very apparent to all of us involved in the learning process. First, the vast increase over recent years in the use of web-based materials to support courses. Where these materials supplement existing lectures and tutorials, the term `blended learning' has recently come in to fashion. Where the materials stand alone, so that they are sufficient to enable external students to learn efficiently, the course matt truly be termed online. Second, the increased realization amongst many educators that interaction is a key component of the learning process for many learners. Equating the amount of interaction with the amount of learning is overly simplistic, however - it is clear from many examples that there can be plenty of interaction without learning, and vice versa. Nevertheless, there would seem to be a strong correlation between interaction and learning. These two trends are viewed with concern by some, since at first appearances they may seem to be antipathetic. However, the field of computer-supported collaborative learning (or CSCL) attempts to bridge the gap between the two, and stands as a paradigm of learning that seems likely to become pre-eminent in the twenty-first century.
Rogers, P Clint; Graham, Charles R, Rasmussen, Rus; Campbell, J Olin; Ure, Donna M	Case 2: Blending Face-to-Face and Distance Learners in a Synchronous Class: Instructor and Learner Experiences.	2003	Quarterly Review of Distance Education	4	245-251	Examines the development of a class at Brigham Young University (Utah) that blends distance and face-to-face students in a synchronous class. This case study focuses on how this blended learning environment was experienced by the distance and face-to-face students, as well as by the instructor.

Ruiz, Jorge G; Mintzer, Michael J; Leipzig, Rosanne M	The impact of E-learning in medical education.	2006	Public health reports	81	207-212	The authors provide an introduction to e-learning and its role in medical education by outlining key terms, the components of e-learning, the evidence for its effectiveness, faculty development needs for implementation, evaluation strategies for e-learning and its technology, and how e-learning might be considered evidence of academic scholarship. E-learning is the use of Internet technologies to enhance knowledge and performance. E-learning technologies offer learners control over content, learning sequence, pace of learning, time, and often media, allowing them to tailor their experiences to meet their personal learning objectives. In diverse medical education contexts, e-learning appears to be at least as effective as traditional instructor-led methods such as lectures. Students do not see e-learning as replacing traditional instructor-led training but as a complement to it, forming part of a blended-learning strategy. A developing infrastructure to support e-learning within medical education includes repositories, or digital libraries, to manage access to e-learning materials, consensus on technical standardization, and methods for peer review of these resources. E-learning presents numerous research opportunities for faculty, along with continuing challenges for documenting scholarship. Innovations in e-learning technologies point toward a revolution in education, allowing learning to be individualized (adaptive learning), enhancing learners' interactions with others (collaborative learning), and transforming the role of the teacher. The integration of e-learning into medical education can catalyze the shift toward applying adult learning theory, where educators will no longer serve mainly as the distributors of content, but will become more involved as facilitators of learning and assessors of competency.

Shaffer, Kitt; Small, Juan E	Blended learning in medical education: use of an integrated approach with web-based small group modules and didactic instruction for teaching radiologic anatomy.	2004	Academic radiology	11	1059-1070	To describe the development of and assess student satisfaction with a blended learning method for teaching radiologic anatomy that integrates web-based instruction with small group and didactic teaching. MATERIALS AND METHODS: In 2002 the teaching of radiologic anatomy to first-year medical students was changed from group learning (20-30 students with a preceptor and films at a viewbox) to a blended learning model that included a brief didactic introduction followed by small group (7-8 students) web-based structured learning modules with rotating lab instructors. In 2003 the modules were changed to include self-study cases prior to the lab, follow-up cases, and twice-weekly optional review sessions. Students and lab instructors were surveyed for their response to the content and design of the sessions. RESULTS: Course surveys in 2001, with a response rate of 84%, showed 58 negative comments regarding inconsistency between various instructors. Individual response rates for 2002 for radiologic anatomy teaching sessions (RadLab) surveys ranged from 56%-81%, dropping as the course progressed. All RadLabs were rated “very useful” or “useful,” except the cardiovascular lab, which was not designed as an interactive module. In 2003, after redesign of the cardiovascular lab in the same format as the other labs, all RadLabs were rated 2.4 or better (useful). CONCLUSION: An integration of computers with small and large group didactic instruction allow optimal use of faculty, conform to accepted theories of adult learning, and are well-accepted by students.
Singh, Harvey	Building Effective Blended Learning Programs.	2003	Educational Technology	43	51-54	Discussion of electronic learning and Web-based learning focuses on blended learning programs which can include offline and online learning; self-paced and live, collaborative learning; structured and unstructured learning; and custom content and off-the-shelf content.

						Describes different possibilities for interpreting the "blending". Argues that via using blended learning universities can optimize the costs, extend the reach (number and region of students). Describes a model, called Khan's Octagonal Framework, which can be used to create the appropriate blend (institutional, pedagogical, technological, interface design, evaluation, management, resource support and ethical dimensions need to be addressed in order to get the best blend).
Steve Semler	Use Blended Learning to Increase Learner Engagement and Reduce Training Costs	2001	Learning Safari Newsletter. . http://www.learningsim.com/content/lsnews/blended_learning1.html			Author gives the "hand-book-style" introduction about designing a BL course. Blending online learning methods with classroom training makes training sessions shorter and allows your learners to take the training wherever they go. Some relatively simple techniques can help you convert courses to blended delivery.There are three overall objectives to this activity: 1) increase learning impact, 2) increase learner satisfaction and ease of use, and 3) reduce the total cost of training. By focusing the classroom portion of the course on skill practice and application, you can increase learning impact. You can also allow learners to explore and work with the content where and when makes sense for them. By offering portions of a course as online self-study, you can reduce the length of the face to face training session and the associated delivery and travel costs.
Tallman, Julie, Fitzgerald, Mary Ann	Blending Online and Classroom Learning Environments: Reflections on Experiences and Points to Consider.	2005	Knowledge Quest	34	25-28	Presents information on how the authors established a blended online and classroom program. Consideration of the learning needs and technology skills of students; Need for a face-to-face orientation session prior to each term; Reference to the factors that are crucial for all levels of online education; Effectiveness of the program during its first four cohorts.

Taradi, Suneana Kukolja, Taradi, Milan, Radie, Kreimir, Nikia Pokrajac	Blending problem-based learning with Web technology positively impacts student learning outcomes in acid-base physiology	2005	Advances in Physiology Education	29	35-39	World Wide Web (Web)-based learning (WBL), problem-based learning (PBL), and collaborative learning are at present the most powerful educational options in higher education. A blended (hybrid) course combines traditional face-to-face and WBL approaches in an educational environment that is nonspecific as to time and place. To provide educational services for an undergraduate second-year elective course in acid-base physiology, a rich, student-centered educational Web-environment designed to support PBL was created by using Web Course Tools courseware. The course is designed to require students to work in small collaborative groups using problem solving activities to develop topic understanding. The aim of the study was to identify the impact of the blended WBL-PBL-collaborative learning environment on student learning outcomes. Student test scores and satisfaction survey results from a blended WBL-PBL-based test group (n = 37) were compared with a control group whose instructional opportunities were from a traditional in-class PBL model (n = 84). WBL students scored significantly (t = 3.3952; P = 0.0009) better on the final acid-base physiology examination and expressed a positive attitude to the new learning environment in the satisfaction survey. Expressed in terms of a difference effect, the mean of the treated group (WBL) is at the 76th percentile of the untreated (face-to-face) group, which stands for a medium effect size. Thus student progress in the blended WBL-PBL collaborative environment was positively affected by the use of technology.
Thorne, Kaye	Blended learning: how to integrate online & traditional learning	2003	London Ans Sterling. Kogan Page			The main purpose of the book is to show how useful blended leering is in the learning process due to the theory of peoples differences in which method to use when learning how they prefer to learn. Blended makes the possibility

						to personalize learning and teaching/training.
Tim Scholze	The Role of e-Learning for Training in Institutions of The Third Sector		www.elearningeuropa.com			Number of projects are being developed to help to face the structural change and the introduction of new technologies in the European Health and Social Sector (3rd sector). From April 02 May 04 the project ITs Social! developed new training and education approaches for third sector organisations. By introducing the ICT as training and communication instruments, the initiatives seek to promote innovative ways of training and to facilitate the access to lifelong learning for disadvantaged people normally being kept out of traditional learning schemes.
Troha, F.	Bulletproof Instructional Design: A Model for Blended Learning.	2002	http://www.usdla.org/html/journal/MAY02_Issue/article03.html			
Van Eijl, Pierre J. , Albert Pilot, Peter De Voogd	Effects of Collaborative and Individual Learning in a Blended Learning Environment	2005	Education and Information Technologies	10	49-63	In courses using a virtual learning environment (VLE), some students like to work together, and some do not. If we give students the opportunity to choose either teamwork or individual study, how does this affect their marks and their appraisal and assessment of the course? This question has been investigated in the context of an English Literature course at the University of Utrecht. In this course, studentswork intensively with a VLE, and attend lectures: a blended learning environment. Previous research has shown that the pedagogical design used provides a powerful learning environment. provides a powerful learning environment This time, students had the choice of working on the course assignments in small teams (24 students), or individually. Both groups were compared based on their study results, and the answers to a questionnaire. Students valued the choice. Mainly those students with high marks for a previous course, which had a similar pe-

						dagogical design, preferred collaboration. Statistical analysis showed that collaboration resulted in significantly better marks.
Waddoups, Gregory L; Hatch, Gary L; Butterworth, Samantha	Case 5: Blended Teaching and Learning in a First-Year Composition Course.	2003	Quarterly Review of Distance Education	4	271-278	Analyzes the blended learning environment in an introductory first-year writing course at Brigham Young University (Utah). The success of this course is compared with the tradition version of the course. The paper describes the process and outcomes associated with teaching and learning within a blended learning environment.
Welker, Jan; Berardino, Lisa	Blended Learning: Understanding the Middle Ground between Traditional Classroom and Fully Online Instruction	2005	Journal of Educational Technology Systems	34	33-55	This article is about how two researchers are trying to comfortably and logically place blended learning somewhere in the middle of two extremes--traditional classroom at one end and fully online distance learning at the other end. Twenty-two faculty and 38 students at the State University of New York Institute of Technology (SUNYIT) responded to a survey on perceptions held about blended learning. Responses from faculty revealed enrollment as a major factor in the increased use of this course design; quality of assignments and course grades that are as good or better; and courses that are producing improved writing and discussions. While the design is easy to use, faculty reported more work on their part and some loss of traditional classroom dynamics. Students reported flexibility, convenience, and independence as advantages, along with confusion, reduced social interaction, and more work as disadvantages. However, there appears to be a net economic gain for students as tuition and financial aid remain unchanged while expenditure in time and travel are reduced. Course management technology and course design recommendations are provided for faculty consideration. The boundaries between traditional classroom instruction and fully online distance learning are blurring. As course design moves more toward a fully online look-alike, expectations for

						a smoothly operating course will be higher for both faculty and students.
Willem, Cilia , Martin Aiello, Antoni Bartolom	Self-Regulated Learning and New Literacies: an experience at the University of Barcelona.	2006	European Journal of Education	41	p437-452	This article summarises the findings from an evaluation of a Media Literacy course at the University of Barcelona. It focuses on some aspects of Self-Regulation and on the learning environment used by students. The students learning processes were embedded in an eLearning project, in which students analysed the representation of immigrants and ethnic minorities in the media. Key findings are the usefulness of this particular Technology-Enhanced Learning Environment (TELE), and its specific settings regarding Self-Regulated Learning (SRL). Students self-regulated their learning processes, in that they were working in a blended learning environment. However, their acquired media literacy skills seem to be fostered by the TELE rather than by the self-regulation mechanisms. Throughout the article, special attention is paid to the conceptual framework of digital and media literacy, and the specific competences related to them.
Yeh, Dowming; Lee, Chun-Hsiung; Sun, Pei-Chen	The Analysis of Learning Records and Learning Effect in Blended e-Learning	2005	Journal of Information Science and Engineering	21	973-984	Some teachers adopt a blended learning model that combines traditional classroom teaching and an e-learning system. In this model,, a teacher may teach the first few sessions in a classroom. After the students have established a general idea of the course, they can then proceed to online learning and interaction. This study aimed to discover the relationship between learning records and the learning effect in a blended e-learning environment through multiple regression analysis. The learning records considered included the grades for online assignments, reading time, the total number of login times, and the total number of online discussions. The learning effect was defined as the total grade for two monthly exams and one final exam. To collect learning record data, an e-learning system was designed that integrates the data collection functionality of learning

						activities with a with a teaching material managing module so that the learning records of all the learners are recorded automatically. With this system, an experiment was conducted on a program design course in a local high school. The results differed from those obtained in a 'pure' e-learning setting, and the online homework performance was the only item that significantly accounted for the learning effect, which is a natural result of learning procedural knowledge.

Blended Learning:
Relatórios de investigação e exemplos de boas práticas

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Blended Learning:

Relatórios de investigação e exemplos de boas práticas

SUMÁRIO

Agradecimentos

O projecto *B-Learn Project* foi criado com o objectivo de proporcionar possibilidades de aprendizagem e de ensino que integram métodos de aprendizagem tradicionais com métodos disponibilizados pelas novas tecnologias. A ideia deste projecto nasceu da necessidade que sentiam os profissionais que dão apoio na área do *e-learning* em várias universidades de poder disponibilizar aos docentes – e também aos técnicos de educação e outras pessoas envolvidas no desenvolvimento de novas oportunidades de ensino – informação sobre a construção e desenvolvimento de cursos de *Blended Learning*.

A integração da investigação e de exemplos práticos constitui uma boa base de partida para se iniciar a mudança em universidades que por definição estão vocacionadas para a investigação. Nas páginas que se seguem é apresentada uma série de soluções possíveis.

As autoras deste volume - Sofia Torrão da Universidade do Porto e Saima Tiirmaa-Oras da Universidade de Tartu - gostariam de agradecer a contribuição de todos os participantes do projecto "Project B-Learn":

Jyri Manninen do "Palmenia Centre for Continuing Education", da Universidade de Helsínquia;

Cecilie Hansen e Konrad Morgan do "Department of Information and Media Science" da Universidade de Bergen;

Mart Laanpere da Universidade de Tallinn;

Harald Haugen, Bodil Ask e Svein-Ove Lysne do College ICT in Education representando o grupo NITOL (Norway-net with IT for Open Learning) da Universidade de Stord/Haugesund;

Ildiko Mazar, European Distance e E-learning Network;

Vilma Ruta Mušankoviene, Danguole Rutkauskiene e Vida Motekaytite, Distance Education Centre, da Kaunas University of Technology;

Lehti Pilt, Aune Valk, Anne Villems e Triin Marandi da Universidade de Tartu; e

Karin Ruul do Estonian E-learning Development Centre.

A presente edição foi composta e publicada no âmbito do projecto Socrates Minerva B-Learn Project – Assisting teachers of traditional universities in designing Blended Learning (225565-CP-1-2005-1-EE-MINERVA-M). Este projecto teve o apoio financeiro da Comissão Europeia e uma contribuição considerável de todos os parceiros envolvidos.

Introdução a este manual

Algumas noções sobre *Blended Learning*

Caro leitor,

Este volume apresenta uma síntese de casos de estudo e de investigação na área do *Blended Learning* – uma combinação de boas práticas e de conhecimento teórico.

A designação *Blended Learning* foi usada pela primeira vez na literatura americana com o sentido de se compreender a combinação entre o ensino tradicional e o ensino tecnológico usando uma ampla série de métodos pedagógicos e de diferentes formas tecnológicas (Gynther 2005). O conceito e a acepção desta designação não é consensual na teoria sobre a aprendizagem.

A principal conclusão a ser tirada é que o *Blended Learning* é difícil de conceptualizar como uma ideia única. Existem várias interpretações e como tal são muitos e diferentes os aspectos que têm sido investigados. O resultado é que o *Blended Learning* é mais um dos modos a ser usados no âmbito de outros modelos pedagógicos.

O *Blended Learning* é entendido mais frequentemente como uma forma de combinar o ensino presencial e o ensino tecnológico, havendo várias abordagens diferentes para o usar, sendo a mais importante aquela que tem em vista a integração dos dois modos de ensino num só. O aspecto mais importante de se encontrar a abordagem correcta é considerar as possibilidades, vantagens e prioridades diferentes do ensino presencial e do ensino tecnológico.

O *Blended Learning* não é uma nova abordagem no ensino universitário. O que é novo é a grande série de componentes possíveis numa combinação deste tipo. As instituições têm que decidir, através de critérios seleccionados, de que forma esses componentes devem ser combinados para dar lugar a resultados frutíferos de uma forma permanente, determinando o equilíbrio entre o ensino

presencial e os componentes tecnológicos nos métodos didácticos. Ao criar, desenvolver e disponibilizar diferentes tipos de combinações – componente, integrado, collaborativo ou expansivo – o resultado da aprendizagem tem que estar em foco. Esta situação tem que ser investigada tendo em conta os formandos, a cultura, os recursos de aprendizagem, a infraestrutura electrónica, a possibilidade de redimensionamente e de manutenção da solução proposta. O projecto *B-Learn Project* foi criado para oferecer formas de integração de estratégias tradicionais com métodos disponibilizados pelas novas tecnologias de ensino e de aprendizagem. A ideia é possibilitar que os docentes em universidades tradicionais encontrem ideias inovadoras para apresentar e ensinar de forma fácil e aceitável. Este projecto analisou a investigação realizada bem como exemplos práticos que oferecem uma boa base para desencadear a mudança na pedagogia universitária.

No presente volume apresentam-se os resultados da colecção de casos nacionais de *Blended Learning* com origem em cinco países europeus. Esses exemplos são uma boa forma de mostrar para que é que o *Blended Learning* pode ser utilizado. Este manual contém também quarto relatórios de investigação que delineam teorias diferentes sobre *Blended Learning*, exemplos de como o *Blended Learning* pode ser integrado nas universidades europeias tradicionais, exemplos de diferentes projectos de investigação e o uso de *Blended Learning* num contexto comercial.

O grupo de projecto acredita que esta introdução aos modelos de *Blended Learning*, teorias e boas práticas irá fomentar o desenvolvimento de abordagens didácticas futuras em universidades tradicionais ao disponibilizar noções amplas sobre a combinação de métodos de ensino tradicional e tecnológicos. O público-alvo principal é o dos utilizadores do *Blended Learning* (professores, estudantes, criadores de cursos, tecnólogos educacionais), a maior parte de instituições de ensino superior, mas também de outro tipo de instituições.

As autoras gostariam de expressar o seu agradecimento a todos aqueles que colaboraram com a equipa de projecto na colecção e sínteses dos dados para a presente edição. Um agradecimento especial deve ser enviado aos docentes que disponibilizaram os seus cursos de *Blended Learning* para análise, possibilitando desse modo que os nossos leitores beneficiem da sua experiência.

Teorias sobre o *Blended Learning*

Introdução

Este capítulo enquadra as descobertas mais importantes resultantes da revisão da literatura sobre *Blended Learning*, sendo o relatório dividido em três partes, cada uma focando diferentes aspectos do fenómeno. Em jeito de introdução são analisados os diferentes conceitos e definições de *Blended Learning*. A segunda parte enquadra diferentes teorias pedagógicas que usam *Blended Learning* e na terceira parte são analisadas algumas abordagens para introduzir o *Blended Learning* como um método didáctico. A maior descoberta da revisão da literatura é que o *Blended Learning* é difícil de conceptualizar como uma única ideia só. Existem diversas interpretações do tema e como tal são investigados diferentes aspectos.

O que é o *Blended Learning* ?

São vários os artigos e livros nos quais se aborda a teoria do *Blended Learning*. A própria designação refere-se aos vários aspectos que envolvem a aprendizagem e o ensino. Quando se investiga essa designação torna-se óbvio que não existe apenas uma forma de a definir ou abordar.

Uma outra característica deste fenómeno é que esta designação não tem uma tradução directa noutras línguas. A questão poderia ser então se noutros casos em que se investiga e pesquisa problemas similares, não definidos como *Blended Learning*, se usa essa designação. É possível dar uma resposta afirmativa a esta questão se a investigação corresponde às definições daquilo que é o *Blended Learning*.

Definir investigação não usando essa designação seria uma grande tarefa metodológica, por isso este capítulo irá basear-se apenas naquela investigação em que é usada a designação *Blended Learning*.

Tal como muitos outros autores, Gynther (2005) também afirma que a lacuna inicialmente existente entre a aprendizagem tradicional e a aprendizagem virtual e à distância, baseada na Internet está a desaparecer. Num futuro próximo toda a aprendizagem irá apoiar-se em soluções flexíveis mais ou menos digitais ou baseadas na rede dentro da instituição educacional. A dimensão virtual está a aparecer em todas as formas de educação, seja numa fase experimental ou já numa fase de implementação.

A designação *Blended Learning* tem origem americana e implica uma combinação do ensino tradicional e do ensino tecnológico usando uma vasta série de métodos pedagógicos e de formas distintas de tecnologia.

No seu livro, Josh Bersin's (2004) - *The Blended Learning Book: Best Practices, Proven Methodologies and Lessons Learned* – define *Blended Learning* como uma combinação de diferentes meios de formação (tecnologias, actividades e tipos de eventos) para criar um programa ideal de formação destinado a um público-alvo específico. Bersin usa a designação *Blended Learning* no sentido daquela formação tradicional que é liderada pelo formador mas que tem o suporte electrónico no qual os programas de *Blended Learning* usam variadas formas de ensino à distância, porventura complementado com formação liderada pelo formador e por outros formatos em tempo real (:56).

Muitos dos autores que usam a designação *Blended Learning* escrevem manuais sobretudo para o público-alvo das empresas. Bersin inclui-se nesse grupo de autores, mas Kaye Thorne (2003), que considera que o *Blended Learning* é a evolução mais lógica e natural da nossa aprendizagem, também. Ele considera que o *Blended Learning* é uma solução elegante para os desafios de adaptar a aprendizagem e o desenvolvimento às necessidades dos indivíduos, o que representa uma oportunidade de integrar os avanços

tecnológicos inovadores que são disponibilizados pelo ensino virtual com a interacção e participação que o melhor ensino tradicional oferece. O *Blended Learning* pode ser apoiado e valorizado usando-se o conhecimento e o contacto pessoal dos tutores/formadores (:16).

No livro de Thorne - *Blended Learning : how to integrate online & traditional learning* - o *Blended Learning* é definido como uma mistura resultante da forma tradicional de formação em sala e de acompanhamento pessoal com:

• tecnologia multimédia
• transmissão vídeo em CD ROM video streaming
• Salas de aula virtuais
• Correio de voz, correio electrónico e audio-conferências
• Animação de texto *online* e transmissão vídeo

Tal como acima mencionado, muitos dos livros da área do *Blended Learning* têm uma abordagem voltada para o "saber-fazer" tendo como principal público-alvo empresas (privadas) e lidam com a questão principal de como é que podem as empresas em causa tornar a formação mais eficaz, menos onerosa e demorada. Esses manuais dirigem-se aos leitores num estilo muito informal, não-académico, com tópicos tais como "Como é que isto pode ser útil? Será que isto é útil para a sua organização? Como é que pode implementá-lo?" Publicitam o *Blended Learning* como o método de formação para as empresas sugerindo que se trata de um método entusiasmante, inovador e que soluciona quase todos os problemas da formação.

Para além desses manuais existem também vários artigos académicos que abordam essa designação. Whitelock & Jelfs (2003) fazem a abertura de um número especial de uma revista sobre *Blended Learning* no qual estes autores introduzem três definições para a designação:

1. combinação integrada de ensino tradicional com abordagens *online* baseadas na Internet;
2. combinação de meios e ferramentas empregues num ambiente de ensino à distância; e
3. combinação de uma série de abordagens pedagógicas, independentemente da tecnologia de ensino utilizada.

Destas definições, a primeira é aquela que é considerada por Singh (2003 em Oliver & Trigwell 2005) como a interpretação mais comum. A segunda também está difundida apesar de por vezes ser defendida de uma forma mais genérica, como dizendo respeito a modelos que combinam vários modos de apresentação, em vez de privilegiar o ensino à distância. Oliver & Trigwell consideram que Singh dá uma descrição mais substancial que aprofunda a terceira possibilidade, baseada naquilo que ele considera ser um conjunto muito mais rico de estratégias de ensino ou dimensões que podem ser combinados em modos tais como: *offline* e *online*; auto-aprendizagem com modo real, colaborativo, estruturado com não-estruturado; conteúdos parametrizados com conteúdos disponíveis no momento; e por aí diante.

Uma outra abordagem é apresentada por Kerres & De Witt (2003), que consideram o *Blended Learning* como uma mistura de métodos didácticos diferentes e de formatos de apresentação. A sua argumentação está baseada na acepção de que estes dois são independentes um do outro.

Oliver e Trigwell mencionam todos estes artigos mas também se referem à conclusão de Driscoll no seu livro (2002) na qual ela identifica quatro "conceitos" que se podem extrair desta designação:

4. combinar ou misturar tecnologia com base na Internet para atingir um objectivo educacional;
5. combinar abordagens pedagógicas (por ex. construtivismo, behaviourismo, cognitivismo) para produzir ensino ideal
6. resultados com ou sem tecnologia educativa;
7. combinar qualquer forma de tecnologia educativa com formação presencial liderada pelo formador; e
8. combinar tecnologia educativa com tarefas profissionais reais.

"The point is that Blended Learning means different things to different people, which illustrates its widely untapped potential" [N.T.: o que importa é que o *Blended Learning* tem significados diferentes para pessoas diferentes o que demonstra o seu inexplorado potencial] - escreve Driscoll (Oliver e Trigwell 2005). Oliver e Trigwell consideram que a explicação dada por Hofmann (2001) é mais precisa.

Ela propõe que o conceito que está por detrás do *Blended Learning* é o de que os criadores de cursos revêem um programa de formação, dividem-no em módulos e definem qual é o melhor meio de os apresentar aos formandos. Oliver e Trigwell introduzem uma última perspectiva que é a dada por Valiathan (2002), que descreve as combinações no sentido de se criar um foco na aprendizagem ou na aprendizagem "pretendida":

1. aprendizagem centrada nas capacidades, que combina a auto-aprendizagem com o apoio de um formador ou professor para desenvolves conhecumentos e capacidades específicas;
2. aprendizagem centrada nos comportamentos, que mistura vários acontecimentos e meios de apresentação para desenvolver comportamentos específicos; e
3. aprendizagem centrada nas competências, que mistura ferramentas de apoio ao desempenho com recursos de gestão do conhecimento e orientação para desenvolver competências no local de trabalho.

Oliver e Trigwell são críticos quanto ao uso da designação *Blended Learning* em qualquer contexto porque consideram que a característica que é comum a todos estes exemplos e definições é o facto de todas partirem da perspectiva do professor, do formador ou de quem cria o curso.

O resultado principal desta investigação sobre o uso da designação *Blended Learning* baseada nos artigos de Oliver e Trigwell (2005), Whitelock & Jelfs (2003) e muitos outros demonstra que não existe um entendimento comum sobre o conceito e a acepção da designação *Blended Learning* no âmbito da teoria da aprendizagem.

Teoria da aprendizagem:

Um outro aspecto do *Blended Learning* tem a ver com a sua abordagem das teorias pedagógicas. A teoria do *Blended Learning* não parece "pertencer" a uma teoria de aprendizagem mas ser antes um método usado no âmbito de diferentes abordagens pedagógicas. Nos artigos que descrevem o *Blended Learning* são usadas diferentes teorias pedagógicas (Oliver e Trigwell 2005, Whitelock & Jelfs 2003). Hiltz e Murray (2005) apresentam o *e-learning* como sendo a última de uma longa lista de tecnologias sociais que foram introduzidas para melhorar o ensino à distância ao acrescentar-lhe vários aumentos, substituições ou combinações de novas

abordagens e tecnologias pedagógicas. Os autores consideram que o ensino online está a revolucionar o ensino superior em ambos os contextos: como um processo e como uma instituição de cariz social. Descrevem o ensino *online* remoto como um processo social novo que começa a agir como um total substituto tanto para o ensino à distância como para o ensino tradicional presencial. E considera-se um substituto de ambos porque se trata de um processo que se infiltra na comum aula presencial e porque irá mudar radicalmente a natureza daquilo que é considerado o típico curso universitário.

Roberts (2004) enfatiza como o '*Blended Learning*' se tornou recentemente muito usado como suplemento às aulas e tutoriais tradicionais ao permitir que os estudantes externos aprendam de um modo eficaz. Ele considera que as duas tendências são muito evidentes para todos aqueles que estão envolvidos no processo de aprendizagem.

Em primeiro lugar ele descreve o aumento considerável no uso de materiais da Internet para apoio aos cursos. Em segundo lugar, muitos educadores consideram que a interacção é o componente-chave do processo de aprendizagem para muitos formandos. Considera ainda que a área da aprendizagem colaborativa com uso do computador (*computer-supported collaborative learning* - CSCL) constitui a tentativa de estreitar a distância entre a interacção e a aprendizagem, constituindo-se como um paradigma de aprendizagem que parece provável que se venha a tornar preeminente no século XXI.

Thorne (2003) é de opinião que o *Blended Learning* é uma forma de tornar a aprendizagem mais individualizada, referindo-se a Haward Gardner quanto ao facto de as pessoas responderem de forma positiva a diferentes estímulos de aprendizagem. Desta forma as organizações e as escolas podem oferecer às pessoas diferentes formas de trabalho dando-lhes a liberdade de serem si próprias. Outras abordagens pedagógicas muito usadas são a teoria da actividade e a teoria da aprendizagem social construtiva (Bjarno 2005).

Taradi et al. (2005) apresentam o *Blended Learning* como uma de três opções educacionais no ensino superior. Os três princípios pedagógicos são (*Web)-based learning (WBL*) [N.T.: aprendizagem com base na Internet], *Problem-based learning* (PBL) [N.T.: aprendizagem com base na resolução de problemas] e aprendizagem colaborativa. Taradi define *Blended Learning* indicando que um curso deste tipo (híbrido) combina abordagens tradicionais de ensino presencial com abordagens de WBL num ambiente educacional que não tem tempo nem local específicos.

Alonso et al. (2005) consideram que faz falta um esforço para encontrar soluções para os problemas psicopedagógicos nesta nova categoria educacional e afirmam que a mais recente inovação na psicologia do processamento da informação e no construtivismo social será um modelo de ensino psicopedagógico que se baseie na estrutura do conteúdo. Os autores definem esta abordagem "combinada" do processo de aprendizagem. Do ponto de vista tecnológico o modelo de ensino apoia-se em objectos de aprendizagem, um conceito herdado do paradigma com orientação para os objectos.

Gynther (2005) destaca que a designação *Blended Learning* coloca quarto diferentes questões didácticas em foco:

1. Que tipo de conhecimentos devem os estudantes obter e que tipo de formato pedagógico será necessário para organizar esse ensino?
2. Como é que se deve organizar a sala de aula?
3. Como é que se deve organizar o ambiente de aprendizagem ?
4. Que tipo de recursos de aprendizagem pode construir-se com base nas suas escolhas?

A designação *Blended Learning* é usada mais comummente no sentido de se tratar de uma combinação de ensino tradicional com ensino baseado na Internet. Gynther afirma que a acepção americana da designação é muito difusa e argumenta que é mais frutífero ligar a designação a um método didáctico mais concreto (:11). O autor acrescenta ainda que as questões acima mencionadas são importantes para o professor reflectir sobre elas quando conceber um novo modelo de ensino.

Gynther (2005) considera que a designação *Blended Learning* diz respeito não só à combinação entre o ensino tecnológico e o ensino tradicional em sala de aula, mas também à questão que se prende com aquilo que se aprende, com que método pedagógico e que tipo de tecnologia que promova a aprendizagem e diferentes formas de conhecimento são usadas nesse ensino. É importante encontrar soluções tecnológicas que apoiem escolhas didácticas diferentes. A comunicação presencial é hoje em dia apenas uma das diversas formas possíveis de organizar o ensino e a aprendizagem. O autor descreve de que forma o mercado educacional do futuro irá colocar as diferentes instituições ligadas ao ensino sob novos tipos de pressão devido a novos tipos de educação, de assuntos e de estudantes. O novo tipo de estudantes exige conceitos educacionais mais flexíveis nos quais os novos perfis de utilizador estão em destaque. Isto também tem consequências para a concepção da aprendizagem.

O resultado é que o *Blended Learning* não é um paradigma de aprendizagem por si só, mas antes um modo de apresentação que pode ser usado no âmbito de outros modelos pedagógicos. Neste sentido seria provavelmente sensato apresentar o *Blended Learning* mais como um modo pedagógico.

Abordagens ao *Blended Learning* :

Tendo em conta que o *Blended Learning* é sobretudo entendido como uma forma de combinar o ensino presencial com o ensino tecnológico e é descrito como uma abordagem a ser tida no âmbito de outras abordagens pedagógicas seria interessante olhar para diferentes formas de abordar a combinação destas formas distintas de ensino. Hiltz e Murray (2005) consideram que os cursos presenciais que são combinados de forma correcta com tecnologias de ensino pela Internet são avaliados geralmente pelos estudantes como melhorias significativas no ensino tradicional mas o ritmo desta mudança depende de factores sociais diferentes.

Bersin (2004) defende duas abordagens concretas e considera que o objective do *Blended Learning* é sintetizar o ensino presencial e o ensino tecnológico numa combinação integrada. Dessa forma o ensino pode ser adaptado de acordo com as necessidades reais. Por um lado a tecnologia pode complementar os programas tradicionais orientados por um professor e por outro pode complementar o ensino tecnológico naqueles pontos em que o processo de sociabilização falhe e em que os estudantes notem falta de motivação e de entusiasmo por parte do professor. Deste modo Bersin conclui que existem duas abordagens principais ao *Blended Learning*:

1. O modelo de “program flow”: um currículo passo-a-passo que integra vários meios num programa cronológico ou programa de estudos. Os capítulos baseiam-se uns nos outros. Termina com um exercício ou avaliação para avaliar a aprendizagem total. Este modelo é comparável a um curso de ensino superior ou secundário.
2. O modelo “core-and-spoke”: uma abordagem principal de formação (em sala de aula ou em ambiente virtual) com outros materiais, interactividades, recursos e modos de avaliação considerados como “materiais de apoio, opcionais ou obrigatórios” que rodeiam e complementam a primeira abordagem.

A primeira abordagem cria tanto um elevado nível de empenho como uma alta taxa de conclusão. Por esse motivo os estudantes sentem-se mais empenhados e podem planear a sua formação ao longo do tempo.

Bersin considera que esta abordagem também permite aos estudantes terem tempo para adaptar a sua formação aos seus compromissos e ao mesmo tempo obriga-os a continuar o programa até o concluirem. Esta abordagem permite que os professores vão detectando o progresso dos alunos e descubram alguns problemas pontuais. Bersin é de opinião que esta abordagem é adequada ao ensino em sala de aula. Adequa-se à maior parte dos paradigmas de criação de cursos (aprender/tentar/avaliar) e é perfeito para um programa de certificação, sendo fácil de modificar e de manter.

A segunda abordagem apresentada por Bersin está concebida como um único curso que usa um único meio (electrónico ou presencial) e que usa outros meios ou actividades de aprendizagem como material opcional ou suplementar. Os estudantes decidem por si próprios que material suplementar vão usar e não precisam de concluir o curso em simultâneo. Esta abordagem parte do princípio que os estudantes são formandos independentes e motivados. Este modelo agiliza o processo de desenvolvimento porque a organização que providencia a formação pode preparar os materiais suplementares ao longo do tempo.

Tal como mencionado no início deste relatório Valiathan (2002) apresenta uma outra abordagem dividida na realidade em três diferentes: aprendizagem centrada nas capacidades, que combina a auto-aprendizagem com o apoio de um formador ou professor para desenvolver conhecimentos e capacidades específicas aprendizagem centrada nos comportamentos, que mistura vários acontecimentos e meios de apresentação para desenvolver comportamentos específicos and aprendizagem centrada nas competências, que mistura ferramentas de apoio ao desempenho com recursos de gestão do conhecimento e orientação para desenvolver competências no local de trabalho. Petra Neumeier (2005) estudou a aprendizagem de línguas no decurso dos processos de criar, produzir e implementar materiais de apoio *CALL-supported materials*. Ela considera que as pessoas que criam os cursos precisam de um modelo de parâmetros que as ajude a tomar decisões sobre a implementação individual e contextual do *Blended Learning*. De modo a atingir uma melhor compreensão dos factores que afectam a prática e a experiência do *Blended Learning* a autora apresenta vários parâmetros que criam um ambiente de *Blended Learning*.

Gynther (2005) menciona a procura crescente de educação melhor e menos onerosa, o que para muitos tem estado associado ao uso das tecnologias da informação devido à possibilidade de se obter resultados de aprendizagem inovadores e mais eficazes. Mas os resultados da aprendizagem e as potenciais vantagens do uso de tecnologia têm que ser estudados do mesmo modo que foram o ensino tradicional e os métodos de aprendizagem.

Quando se inicia com o *Blended Learning* tem que se pensar em alguns aspectos:

1. Que vantagens tem o ensino presencial?
2. Que problemas são conhecidos devido à comunicação em salas virtuais?
3. A que aspectos deve o professor dar prioridade no ensino presencial e quais podem ser aplicados ao ensino com base na Internet?
4. Como estabelecer as prioridades entre os diferentes meios e suas diversas formas de uso no ensino?

O mais importante é estar ciente dos problemas e antecipar as coisas. Cada meio tem as suas vantagens e desvantagens, no sentido de ambos poderem apoiar e reduzir a comunicação entre aqueles que tomam parte do processo de ensino e aprendizagem.

De acordo com Gynther quando se seleccionar uma abordagem de *Blended Learning* para implementação deve ser considerado o seguinte:

1. Os meios em causa permitem ao estudante observar a comunicação do professor?
2. Os meios em causa permitem ao professor observar a comunicação do estudante?
3. Os meios em causa permitem ao estudante observar aquilo que os outros estudantes consideram sobre o estudo?
4. Os meios em causa permitem ao estudante observar as suas próprias considerações sobre o estudo?
5. Os meios em causa permitem diferenciar a escolha de informação e de formas de comunicação?
6. Os meios em causa permitem ao professor organizar a comunicação entre os professores e os estudantes? Em grupos e em projecto?
7. De que forma é que o uso de diferentes meios e comunicação se integram no ambiente de aprendizagem?

O autor considera que o *Blended Learning* disponibiliza aos professores formas diferentes de transferir a informação aos estudantes. Deste modo o estudante desenvolve uma maior capacidade de compreender a informação e o *Blended Learning* permite novas formas de comunicação e novas possibilidades didácticas, podendo os estudantes com qualificações diferentes desenvolver uma capacidade mais ampla de apreensão da informação.

Existem diversas formas de integrar o *Blended Learning* no ensino, algumas das quais são abordadas neste capítulo. Visto que o *Blended Learning* é sobretudo reconhecido como uma forma de combinar o ensino presencial com o ensino tecnológico a principal abordagem é como combinar esses dois modos de uma forma integrada. Independentemente da estrutura dos modelos, as abordagens baseiam-se na integração de um ou vários meios. O *Blended Learning* baseia-se em auto-aprendizagem com apoio de um instructor ou formador. Pode-se escolher entre programas cronológicos ou aleatórios que frequentemente culminam numa avaliação opcional ou obrigatória para aferir a aprendizagem total realizada. Na procura da abordagem mais adequada, o aspecto principal é considerar as possibilidades, vantagens, aspectos e diferentes prioridades no ensino presencial e no ensino tecnológico.

Em síntese

O principal resultado desta investigação sobre o uso da designação *Blended Learning* baseia-se nos artigos de Oliver e Trigwell (2005), Whitelock & Jelfs (2003) e muitos outros que mostram que o conceito e a acepção dessa designação não é "ponto assente" na teoria da aprendizagem.

O resultado é que o *Blended Learning* não é um paradigma de aprendizagem por si só mas antes um modo a ser usado no âmbito de outros modelos pedagógicos, mostrando que o *Blended Learning* é mais um modo pedagógico.

Existem diferentes abordagens na integração do *Blended Learning* no ensino, algumas das quais são descritas neste capítulo.

Visto que o *Blended Learning* é sobretudo entendido como uma forma de combinar o ensino presencial com o ensino tecnológico a principal abordagem é como integrar os dois modos num só. Independentemente da estrutura dos modelos, descobriu-se que as abordagens baseiam-se na integração de um ou de vários meios. Existem diversas formas de integrar o *Blended Learning* no ensino, algumas das quais são abordadas neste capítulo. Visto que o *Blended Learning* é sobretudo reconhecido como uma forma de combinar o ensino presencial com o ensino tecnológico a principal abordagem é como combinar esses dois modos de uma forma integrada. Independentemente da estrutura dos modelos, as abordagens baseiam-se na integração de um ou vários meios. O *Blen-*

ded Learning baseia-se em auto-aprendizagem com apoio de um instructor ou formador. Pode-se escolher entre programas cronológicos ou aleatórios que frequentemente culminam numa avaliação opcional ou obrigatória para aferir a aprendizagem total realizada. Na procura da abordagem mais adequada, o aspecto principal é considerar as possibilidades, vantagens, aspectos e diferentes prioridades no ensino presencial e no ensino tecnológico.

A principal conclusão da revisão da literatura é que o *Blended Learning* é difícil de conceptualizar de um modo único. Existem diversas acepções e como tal são muitos e diversos os aspectos que são investigados.

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Exemplos de estratégias para integrar o *Blended Learning* nas universidades europeias tradicionais

Introdução

Este relatório investiga estratégias de integração do *Blended Learning* nas universidades europeias tradicionais. O presente capítulo descreve exemplos de outros projectos de integração do *Blended Learning* em universidades tradicionais. Em primeiro lugar faz-se uma introdução ao uso da designação *Blended Learning* antes de se apresentar exemplos de estratégias na formação de professores, no ensino das línguas, na formação em saúde, nas ciências sociais e nas humanidades e finalmente em engenharia e nas ciências naturais.

Blended Learning – uma breve introdução

A designação *Blended Learning* é sobretudo entendida como uma combinação de ensino tradicional e de ensino com base na Internet. Whitelock & Jelfs (2003) fazem a abertura de um número especial de uma revista sobre *Blended Learning* no qual estes autores introduzem três definições para a designação:

1. combinação integrada de ensino tradicional com abordagens online baseadas na Internet;
2. combinação de meios e ferramentas empregues num ambiente de ensino à distância; e
3. combinação de uma série de abordagens pedagógicas, independentemente da tecnologia de ensino utilizada.

Destas definições, a primeira é aquela que é considerada por Singh (2003 em Oliver & Trigwell 2005) como a interpretação mais comum.

Se o *Blended Learning* for um método a ser usado por uma instituição educacional o teórico holandês Gynther (2005) destaca que a designação *Blended Learning* coloca quarto diferentes questões didácticas em foco:

1. Que tipo de conhecimentos devem os estudantes obter e que tipo de formato pedagógico será necessário para organizar esse ensino?
2. Como é que se deve organizar a sala de aula?
3. Como é que se deve organizar o ambiente de aprendizagem ?
4. Que tipo de recursos de aprendizagem podem criar-se com base nas suas escolhas?

O autor acrescenta ainda que as questões acima mencionadas são importantes para o professor reflectir sobre elas quando conceber um novo modelo de ensino.

Bersin, (2004) por outro lado, considera que o maior problema com a formação orientada é a falta de dimensão. Se é preciso ensinar milhares de estudantes – o que é o caso frequente numa universidade – dar formação pessoal e experiência prática é praticamente impossível. Outro problema é a duração da formação. O modo frequente de resolver estes problemas nas instituições é introduzir as tecnologias no ensino.

Bersin acredita que neste sentido o *Blended Learning* pode expandir o modelo de ensino no espaço e no tempo. Desse modo o *Blended Learning* pode disponibilizar a educação a um número mais vasto de estudantes. *Blended Learning* não é só um método de reduzir o tempo dispendido pelos docentes ou de redireccionar o tempo dos estudantes, mas também uma forma de admitir mais estudantes num programa académico (Cottrell e Robison 2003).

Esta interpretação do *Blended Learning* pode ter um grande impacto na estrutura social. Não só mais estudantes podem aceder ao ensino superior como também – tal como mencionam Aspden e Helm (2004) - a presença de um ambiente de aprendizagem virtual (*virtual learning environment* ou VLE) num campus universitário pode alterar as dimensões das relações existentes entre discentes e docentes. Haver mais estudantes não será necessariamente o mesmo porque existe menos contacto com os professores e demais pessoal. A literatura de investigação sobre este assunto indica que um maior envolvimento com as tecnologias educacionais pode ter o efeito de aproximar o pessoal e os estudantes (tanto do ponto de vista físico como virtual) em vez de encorajar as instituições com campus a disponibilizarem mais informação à distância. Os estudantes no campus podem beneficiar de um uso adequado de tecnologia de tal modo que se podem sentir cada vez mais ligados à sua instituição e colegas. A tecnologia pode ajudar a estreitar a distância física entre os estudantes, a sua instituição e os seus colegas – mesmo que as reais interacções entre os estudantes ocorram *offline* – e a combinação da aprendizagem em ambiente real e em ambiente virtual pode ser usada para tornar mais eficazes as experiências de aprendizagem e de ensino.

Outros autores afirmam que o *Blended Learning* não é um fenómeno novo. O que é novo é a ampla série de componentes possíveis numa combinação. O factor principal no *Blended Learning* é decidir através de critérios seleccionados de que forma esses componentes devem ser combinados. Esta é a única forma de produzir combinações frutíferas. O foco deve estar sempre no resultado da aprendizagem, em conjunto com os aprendentes, a cultura e os recursos de aprendizagem, a infraestrutura electrónica, a possibilidade de redimensionamento e de manutenção na concepção, desenvolvimento e apresentação de diferentes tipos de combinações. Uma maior oferta de escolha não é um fim em si (Clark 2005).

Muitos dos livros sobre *Blended Learning* têm uma abordagem voltada para o "saber-fazer" tendo como principal público-alvo as empresas (cf: Bersin 2004, Thorne 2003 e McGinnis 2005) e lidam com a questão principal de como é que podem as empresas em causa tornar a formação mais eficaz, menos onerosa e demorada. O *Blended Learning* é descrito como um novo fenómeno que soluciona quase todos os problemas da formação. Esses manuais dirigem-se aos leitores num estilo muito informal, não-académico, com tópicos tais como "Como é que isto pode ser útil? Será que isto é útil para a sua organização? Como é que pode implementá-lo?" e publicitam o *Blended Learning* como o método de formação a ser usado nas organizações.

É difícil encontrar este tipo de soluções de "como fazer" na literatura académica mais tradicional, que se baseia em projectos nos quais o *Blended Learning* foi colocado sob investigação. O principal objectivo destes projectos foi saber se a introdução de meios combinados teve um impacto nos resultados da aprendizagem (cf: Taradi et al. 2005, Bjarno 2005, Neumeier et al. 2005, Voogt et al. 2004 e Concannon et al. 2005, Burgon e Williams 2003, Motteram 2006). Na parte que se segue faz-se uma introdução a alguns desses projectos académciso de investigação.

Exemplos de estratégias na formação de professores

A lei sobre educação na Noruega (UFD 1998) estabelece que todos os alunos de todos os níveis de ensino têm que ter acesso a ensino adaptado. Bjarno (2005) descreve como a investigação nacional mostra que os estudantes de educação não sabem como integrar as TIC (Tecnologias da Informação e da Comunicação) como uma ferramenta construtiva nas disciplinas. Não são necessárias aptidões para as TIC, mas sim – e em primeiro lugar - alguns bons exemplos sobre como usar as TIC como parte integrante de disciplinas diferentes. Quando o Ministro da Educação e Ciência da Noruega desenvolveu um novo currículo nacional para o programa de licenciatura em Educação de Professores em 2003, o departamento de Tecnologias de Informação (TI) da Universidade de Oslo (Oslo University College) viu isso como uma oportunidade de reorganizar o ensino e a supervisão de ICT na educação de professores. Toda a faculdade apoiou a iniciativa e iniciou-se o planeamento do projecto destinado a desenvolver didácticas multidisciplinares com

ICT para reduzir a distância entre a falta de prática na educação de professores e as necessidades nas escolas primárias e secundárias. De modo a atingir este objectivo o departamento de TI usou o conceito de *Blended Learning* para preparar a adaptação da aprendizagem.

Bjarnø (ibid) examinou a combinação do uso de *Blended Learning* para estudantes em preparação para integrar as TIC como uma ferramenta para apoio aos processos de aprendizagem enquanto professores para acabar com a distância entre os conhecimentos dos professores sobre as TIC e a sua capacidade de as usar para amplificar o processo de aprendizagem. Poderiam as TIC – como parte integrante das aulas nas outras disciplinas - ser um modo de preparar os estudantes para o seu trabalho como professores? Integrar as TIC em todas as disciplinas parecia ser uma boa solução para atingir o objectivo. Os estudantes tinham competências em TIC, mas precisavam de exemplos sobre como integrá-las no seu ensino. Para conseguir isto, o departamento de TI começou a ajudar os docentes da universidade a integrar as TIC nas suas diferentes disciplinas em vez de se focar em cursos de TIC independentes.

Ao incorporar o uso didáctico das TIC no processo de aprendizagem, os estudantes de educação receberam uma ferramenta útil para aprendizagem posterior. Os estudantes usaram o material de ensino de modos diversos, mas principalmente sob a forma de:

1. Material de ensino baseado na Internet – *online*
2. Aulas presencias (até um máximo de 350 estudantes)
3. Obtenção de supervisão associada a avaliações em salas de computadores (até um máximo de 30 estudantes)

Foram dadas aulas sobre temas seleccionados que consistiram em material de ensino com base na Internet com avaliações. Também envolveu ligações a diferentes meios, tais como explicações em vídeo, animações, imagens e bandas sonoras, associadas à supervisão em salas de computadores. Este método exigiu que se tivesse uma sala de computadores equipada com um projector de vídeo e um computador por estudante.

Os resultados mostraram que havia uma necessidade contínua de um diálogo didáctico entre o departamento de TI e os outros docentes de forma a atingir a integração bem-sucedida das TIC. A integração das TIC em todas as disciplinas mostrou que o foco estava a afastar-se de aulas planeadas para novas formas educacionais baseadas na supervisão, que permitem aos docentes dispender um tempo mais qualitativo com cada estudante.

Um dos desafios básicos da implementação do projecto na universidade foi a infra-estrutura. Para todas as aulas foi preciso instalar novos computadores com o mesmo *software* que estudantes e o número de computadores e de vídeo-projectores nas salas de aula teve que ser aumentado. Os resultados do projecto mostraram que houve um aumento de 21% de estudantes que responderam que as aulas de TIC e a supervisão foram úteis para o processo de aprendizagem em comparação com o ano anterior antes da integração das TIC. Bjarno considera que o desafio é passar de uma situação em que existem cursos de TIC individuais para outra em que se produz material de ensino multi-disciplinar com as TIC.

Não só os alunos de educação precisam de aprender como usar as tecnologias no seu ensino. Voogt et al. (2004) também constatam como os professores têm falta de competências na integração das tecnologias nos seus processos de ensino. O potencial das tecnologias na sala de aula dificilmente é apreendido e a aprendizagem do uso das tecnologias na sala de aula por parte dos professores é considerado importante. Voogt et al. (ibid) analisaram a organização de um serviço combinado para apoio aos professores do ensino secundário na integração da tecnologia nas suas salas de aula. Esse serviço consistia em *workshops*, materiais curriculares exem

plificativos e comunicação mediada pelo computador. Esta abordagem combinada ao desenvolvimento profissional de professores mostrou que parece tratar-se de um serviço promissor para apoiar a integração das tecnologias na educação.

Para os estudantes de educação a prática deve ser uma das mais importantes partes da sua formação.

Num outro exemplo Motteram (2006) analisa o papel do *Blended Learning* na educação de professores num programa de mestrado na Universidade de Manchester. Os resultados deste projecto mostram também como como a natureza híbrida é importante para os estudantes para lhes permitir aceder a um programa equilibrado que lhes aumente as competências e os conhecimentos e que lhes permita ainda reflectir na prática passada e futura.

Num outro curso de formação universitária de futuros professores de Inglês os estudantes tinham uma mini-prática que implementava um "micro-ensino" num ambiente de sala de aula, como parte de um método de *Blended Learning*. O conceito de aprendizagem estava baseado em teorias de ensino em ambientes de aprendizagem potenciados pela multimedia, no qual as actividades incluiam a gravação das aulas e casos de estudo multimédia e entrevistas electrónicas com um especialista que era um professor experiente da escola secundária. A prática englobava análises de materiais pedagógicos, experiências práticas com planeamento de aulas e a experiência de ser professor num contexto real de ensino.

Os casos de estudo usados como uma ferramenta didáctica na educação de professores pretendiam contribuir para uma relação mais próxima e eficaz entre os aspectos teóricos e práticos da formação de professores. Os casos de estudo multimédia eram hipertextos concebidos como componentes essenciais de módulos de aprendizagem em computador que apoiavam várias formas e estilos de aprendizagem. Os estudantes trabalhavam com o material do caso de estudo em regime de supervisão ou de auto-aprendizagem várias vezes durante o curso. Descobriu-se que existem três tipos de aprendentes: estudantes que criam e aplicam sobretudo experiências, estudantes que estudam sobretudo recursos teóricos e estudantes que criam experiência focando-se numa selecção de recursos (Kupetz e Ziegenmeyer 2005).

Exemplos de estratégias no ensino das línguas

A aprendizagem de línguas não deveria apenas motivar o professor mas também os estudantes de tal como que os faça aprender. Não só é importante para o professor de línguas aprender a usar as tecnologias no seu ensino como pode também ser frutífero para os estudantes que tomem parte num curso de línguas. Nesta perspectiva tanto os professores como os estudantes precisam de sistemas concebidos de tal modo que aumentem a aprendizagem. Petra Neumeier (2005) estudou a aprendizagem de línguas no decurso dos processos de criar, produzir e implementar materiais de apoio *CALL-supported materials*. Ela considera que as pessoas que criam os cursos precisam de um modelo de parâmetros que as ajude a tomar decisões sobre a implementação individual e contextual do *Blended Learning*. De modo a atingir uma melhor compreensão dos factores que afectam a prática e a experiência do *Blended Learning* a autora apresenta vários parâmetros que criam um ambiente de *Blended Learning*.

Esses parâmetros foram baseados e influenciados pelo projecto de investigação e desenvolvimento designado de *JoblineLMU* da Universidade de Munique:

Descritores individuais dos parâmetros

1. Modo • Foco no modo	• Distribuição dos modos • Escolha dos modos
2. Modelo de integração • Sequenciação de modos individuais	• Nível de integração
3. Distribuição de conteúdos de aprendizagem e objectivos e definição de metas	• Em paralelo ou isoladamente
4. Métodos de ensino das línguas	• Uso de métodos de ensino em cada um dos modos empregues
5. Envolvimento dos sujeitos aprendentes	• Padrões de interacção: actividades individuais ou colaborativas (estudantes, tutores e professores) • Variedade de papéis de professor e de aluno • Nível de autonomia
6. Local	• Sala de aula, casa, exterior, sala de computadores, ambientes institucionais

Estes parâmetros descrevem e conceptualizam um ambiente de *Blended Learning* para fins de aprendizagem e ensino das línguas (Neumeier 2005:167).

A autora considera que se os parâmetros forem aplicados com sucesso a ideia de *Blended Learning* poderia servir de "ponte" entre a ampla comunidade de professores, estudantes, especialistas em CALL e profissionais de línguas.

Um outro projecto envolvendo a aprendizagem de línguas foi a introdução de um programa de ensino do Inglês para fins académicos (English for Academic Purposes - EAP) destinado a estudantes britânicos oriundos de ambientes étnicos minoritários e que foi descrito por Harker e Koutsantoni (2005). Os estudantes participaram em dois modos diferentes de aprendizagem durante um programa de 9 semanas de *Blended Learning* e de ensino à distância. Os autores consideram que o modo de *Blended Learning* é muito mais eficaz na retenção dos estudantes ao passo que os níveis de sucesso dos mesmos são similares em ambos os grupos. Para além disso, as opiniões formativas e sumativas desses estudantes sugerem que a maior parte dos estudantes em ambos os grupos ficaram satisfeitos com este programa EAP baseado na Internet.

Exemplos de estratégias na formação em saúde

Ellis et al. (2006) relataram uma investigação fenomenográfica sobre as experiências de aprendizagem dos estudantes através da discussão tanto *online* como presencial. O contexto deste estudo foi o do segundo ano de um curso de licenciatura em psicologia para assistência social no qual o professor criou tarefas de discussão para serem iniciadas em modo presencial e continuadas depois *on-line*. Foi usada uma combinação de questionários de resposta aberta e entrevistas semi-estruturadas para investigar as concepções dos estudantes em relação àquilo que aprendiam e quais eram as suas intenções e abordagens sobre a aprendizagem através da discussão.

A análise dos dados das entrevistas e do questionário de resposta aberta identificou um número qualitativamente diferente de concepções, intenções e abordagens à aprendizagem através da discussão. Foram encontradas associações entre aquilo que os estudantes pensavam que estavam a aprender através da discussão e as suas abordagens sobre a aprendizagem através da discussão e a nota do seu curso. Os autores descobriram que os estudantes com uma concepção mais coesiva e os estudantes que fizeram uma abordagem mais profunda obtiveram melhores notas no curso. Para além disso os resultados mostram que não existe diferença significativa entre abordagens profundas e superficiais da discussão presencial e as notas obtidas.

Davies et al. (2005) analisaram a experiência de estudantes BSc de fisioterapia no desenvolvimento das suas capacidades neurológicas de observação e análise usando uma combinação de actividades em sala de aula tradicional e materiais em suporte informático na Universidade de Birmingham. Na School of Health Sciences (Escola de Ciências da Vida) foram desenvolvidos novos recursos de ensino e aprendizagem apoiados nas ferramentas de ensino virtual disponíveis (Web Course Tools) combinados com uma vasta série de *vídeo-clips* em CD-ROM de doentes com sintomas de problemas neurológicos. Estes recursos disponibilizaram aos alunos a oportunidade de observar "doentes verdadeiros" antes da sua prática clínica, reduzindo deste modo a distância entre a sua acepção teórica destes problemas e a sua experiência prática de avaliar movimentos anormais no ambiente clínico.

Outro exemplo para o sector da saúde é dado por Guldberg e Pilkington (2006). Estes autores analisaram uma amostra de discussões *online* para avaliar o desenvolvimento de aprendentes adultos como profissionais que reflectem sobre o seu trabalho, no âmbito de uma comunidade de aprendizagem em rede. A sua análise demonstra que os estudantes pertencem a uma comunidade de profissionais com subconjuntos diferentes, tais como estudantes que são pais e assistentes de pessoas com ASD (perturbações do espectro autista) que trabalham em conjunto na partilha e construção de conhecimentos comuns.

O discurso partilhado e as noções comuns sobre o que constitui a boa prática ajudaram a criar um espaço seguro de interação entre os estudantes. Assim que a identidade do grupo se consolidou surgiram mais questões desafiantes e o grupo foi capaz de definir outros valores comuns, acepções e objectivos através de processos de resolução.

Exemplos de estratégias na educação nas ciências sociais e nas humanidades

Tanto nas ciências sociais como nas humanidades a produção de textos é a parte mais importante da formação. Aprender produzindo texto é algo que tem sido realizado com o uso de tecnologias como os computadores já há muito tempo, tendo aparecido vários programas de processamento de texto ao longo dos últimos anos. Cox et al. (2004) avaliaram a eficácia educacional das conversas online (*chats*) num curso de pós-graduação em humanidades e no último ano de um curso sobre comércio. Os autores descobriram que os papéis do curso em modo híbrido, a dinâmica de grupo e o estilo de facilitação no uso da colaboração *online* em cursos presenciais facilitam mais inclusivamente as conversações de aprendizagem do que é possível exclusivamente com a interacção presencial.

Webb et al. (2005) sugerem que é o modelo de aprendizagem e a sua integração com as tecnologias de suporte, mais do que a presença da tecnologia por si só, que melhora os resultados da aprendizagem. Os autores observaram quatro tratamentos diferentes com a duração de um semestre que variaram as combinações de discussões em sala de aula e em ambiente virtual. Isso foi usado para o ensino de um curso sobre sondagens na licenciatura em Management Information Systems - MIS (gestão de sistemas de informação). Os resultados sugerem que ao usar a tecnologia da Internet os formadores universitários podem dar aos estudantes a opção de participarem em cursos de elevada qualidade usando a pedagogia de método de caso num ambiente virtual. Para além

so os resultados mostram ainda que os estudantes não só se saem tão bem quanto na sala de aula tradicional como também têm um melhor desempenho em níveis múltiplos de resultados de aprendizagem, especialmente quando se usa uma combinação de aulas em sala de aula e tecnologias em ambiente virtual. Há ainda a vantagem de se poder amplificar as normas da pedagogia de método de caso ao usar-se as discussões em ambiente virtual. Os autores sugerem que os formadores que empregam esta técnica poderão considerar que a sua importância é desvalorizada, ao passo que as exigências de disponibilidade desta abordagem podem ser muito maiores do que as das aulas tradicionais.

Exemplos de estratégias na formação em engenharia e em ciências naturais

Na formação em engenharia e em ciências naturais o uso das tecnologias é muito mais comum que em muitas outras disciplinas. Apesar disso Derntl e Motschnig-Pitrik (2005) consideram que se tem dado pouca atenção na investigação realizada no sentido de integrar as tecnologias para melhorar o processo de aprendizagem em termos de profundidade e âmbito. As experiências e avaliações de um curso académico sobre *Web Engineering* (Engenharia da Internet?) indica que o *Blended Learning* acrescenta valor apenas quando é facilitado por educadores com capacidades interpessoais muito elevadas, a par de tecnologia fiável e de fácil utilização.

Em 2002 a formação em *radiological anatomy* (anatomia radiológica) a estudantes do primeiro ano de medicina passou de uma situação de aprendizagem em grupo (20-30 estudantes com um professor numa *view box* - janela de visualização) para um modelo de *Blended Learning* que incluía uma breve introdução didáctica seguida de módulos de aprendizagem estruturada com base na Internet e em grupos pequenos (7-8 estudantes) com instrutores de laboratório alternados. Em 2003, os módulos foram alterados para incluir casos de auto-estudo antes do laboratório, casos de acompanhamento e sessões de revisão opcionais bi-semanais. Os resultados mostraram que a integração de computadores como instrução didáctica com grupos de estudantes pequenos e grandes é bem aceite pelos estudantes e torna-os receptivos a aceitar as teorias (Shaffer e Small 2004).

Em síntese

O presente relatório mostra que existem vários modos de integrar o *Blended Learning* nas universidades tradicionais. O *Blended Learning* não é uma nova abordagem no ensino e aprendizagem nas universidades. O que é novo é a ampla série de componentes possíveis de uma combinação. As instituições têm que decidir, através de critérios seleccionados, de que forma esses componentes devem ser combinados para dar lugar a resultados frutíferos de uma forma permanente, determinando o equilíbrio entre o ensino presencial e os componentes tecnológicos nos métodos didácticos. Isto exige que quem cria os programas dos cursos tenha sensibilidade para tal.

O *Blended Learning* não é só a combinação de diferentes meios. Ao criar, desenvolver e disponibilizar diferentes tipos de meios – componente, integrado, colaborativo ou expansivo – o resultado da aprendizagem tem que estar em foco. Esta situação tem que ser investigada tendo em conta os formandos, a cultura, os recursos de aprendizagem, a infraestrutura electrónica e a possibilidade de redimensionamento e manutenção da solução proposta.

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Investigação académica e projectos relacionados com o *Blended Learning*

Introdução

A designação *Blended Learning* é usada em diversos projectos de investigação. Nesses projectos e artigos é definida de várias formas e a abordagem da designação varia também de projecto para projecto. Gynther (2005) afirma que a designação foi usada pela primeira vez na literatura americana. A designação deveria compreender a combinação entre o ensino tradicional e o ensino tecnológico usando uma ampla série de métodos pedagógicos e de diferentes formas de tecnologia. Os projectos mencionados neste capítulo são projectos que usam a designação como um termo na investigação descrita. Apesar de usar o termo equivalente o foco principal dos projectos difere e eles são por isso categorizados em quatro categorias: a primeira, olhando-se a projectos nos quais a integração da tecnologia no ensino foi um dos – ou o objectico principal; a segunda, na qual se observa projectos nos quais as percepções sobre o *Blended Learning*, a experiência e os resultados da comunicação e da relação social são o foco principal; a terceira, na qual se olha para os efeitos da didáctica no ensino tradicional; e a quarta, na qual se observam as mudanças nas organizações provocadas pelo *Blended Learning*. Existem vários projectos de investigação nos quais a aobrdagem do *Blended Learning* foi o foco principal, mas este capítulo irá apenas indicar uma selecção deles. No apêndice a este capítulo existe uma lista de outros projectos que lidam com esta abordagem.

Investigação académica e projectos relacionados com a integração da tecnologia e com normas tecnológicas

Muitos projectos se focam no modo como a tecnologia pode ser integrada em diferentes assuntos. Apesar de o uso da tecnologia e do ensino em ambiente virtual não serem novos, tornaram-se mais comuns recentemente no ambiente académico. Kennedy (2005) assinala que durante o período de crescimento havia tempo para o desenvolvimento de normas para assegurar a sua qualidade. No entanto as normas que surgiram tendem a serem derivadas das normas para o ensino convencional, na sala de aula. Não abordam de forma correcta as exigências específicas da formação em ambiente virtual. Kennedy estudou como os formadores de enfermagem poderiam produzir normas credíveis para a sua prática em ambiente virtual e identificou falhas nos actuais guias para professores em ambiente virtual. O conhecimento da produção de normas no serviço de saúde poderia ser uma forma de apoiar a produção de normas no ensino superior. O autor descobriu também que a melhor ajuda para o professor em ambiente virtual não advém do sector da educação, mas do sector industrial, especificamente da indústria das TI. Os formadores de enfermagem na Universidade de Paisley usaram estas descobertas para desenvolver normas para a sua prática de ensino em ambiente virtual.

Apesar de o ensino em ambiente virtual não ser um fenómeno novo, este tipo de normas pode facilitar a integração. Christensen (2003) descobriu no estudo de um curso introdutório em instructional design na Brigham Young University (Utah) que o equilíbrio entre os componentes presenciais e os componentes virtuais é importante caso se pretenda que o *Blended Learning* tenha sucesso. As normas podem facilitar este processo também aos professores, no seu trabalho. Voogt et al. (2004) aplicaram e analisaram a abordagem combinada ao desenvolvimento profissional dos professores em dois estudos. Os autores descobriram que muitos estudos relatam que a implementação da tecnologia na educação é uma inovação complexa.

Os professores em especial não têm as capacidades para integrar a tecnologia nos seus processos de ensino e os potenciais da tecnologia nas salas de aula passam por isso facilmente despercebidos.

Voogt et al. (ibid) analisaram a organização de um serviço combinado que consistia em *workshops*, materiais curriculares exemplificativos e comunicação mediada pelo computador para apoiar os professores do ensino secundário na integração da tecnologia nas suas salas de aula. Os resultados de ambos os estudos mostram que esta combinação parace ser uma solução promissora para apoiar a integração da tecnologia na educação. Todavia, para muitos professores, continua a ser difícil perceber o potencial da tecnologia

na criação de comunidades de prática porque o uso da tecnologia ainda não é congruente com as suas rotinas diárias.
Um outro projecto compreende esta lacuna tecnológica como parte da rotina diária de um professor. Não são necessárias competências nas TIC, mas em primeiro lugar devem ser integrados alguns bons exemplos de como usar as TIC como uma parte integrante em diferentes disciplinas. Bjarno (2005) descobriu que integrar as TIC em todas as disciplinas parecia ser uma boa solução para atingir o objectivo. Os estudantes tinham competências nas TIC mas precisavam de exemplos sobre como integrá-las no seu ensino. Para conseguir isto, o departamento de TI começou a ajudar os docentes da universidade a integrar as TIC nas suas diferentes disciplinas em vez de se focar em cursos de TIC independentes. Os resultados do projecto mostraram que houve um aumento de 21% de estudantes que responderam que as aulas de TIC e a supervisão foram úteis para o processo de aprendizagem em comparação com o ano anterior antes da integração das TIC. Bjarno considera que o desafio é passar de uma situação em que existem cursos de TIC individuais para outra em que se produz material de ensino multi-disciplinar com as TIC.

Um outro exemplo foi realizado por Motteram (2006) que ilustra como é importante a natureza híbrida para os professores para lhes permitir aceder a um programa equilibrado que lhes aumente as competências e os conhecimentos e que lhes permita ainda reflectir na prática passada e futura. O autor baseia as suas descobertas desse estudo sobre o *Blended Learning* na educação de professores num programa de mestrado na Universidade de Manchester. A experiência ajudou-os a usar as tecnologias educacionais na sala de aulas de línguas.

Os exemplos agora mencionados mostram como o *Blended Learning* é útil como um método para pessoas que usam as tecnologias nas suas rotinas diárias para que se familiarizem com a tecnologia como uma ferramenta noutros contextos. O *Blended Learning* torna-se um veículo de aprendizagem de um novo assunto e da tecnologia em si ao mesmo tempo.

Investigação e projectos académicos relacionados com percepções e relações sociais

A integração da tecnologia nas instituições de ensino também tem muito a ver com expectativas e percepções. Esta é outra abordagem que é encontrada em diferentes projectos que lidam com o *Blended Learning*.

Um desses projectos é o de Rogers et al. (2003) que examina o desenvolvimento de uma turma na Brigham Young University (Utah) que combina estudantes em ambiente remoto e em ambiente presencial numa aula síncrone. O estudo centra-se na forma como um ambiente de *Blended Learning* foi sentido por estudantes em regime de ensino à distância e presencial, bem como pelo seu orientador. Enquanto isso um outro estudo realizado por Ruiz et al. (2006) afirma que o *e-learning* permite aos alunos adaptarem a sua experiência de modo a atingir os seus objectivos pessoais de aprendizagem. Esse estudo baseou-se num contexto de formação médica variado e os autores descobriram que os estudantes não sentiram que o *e-learning* estava a substituir a formação tradicional em sala, mas sim a complementá-lo, fazendo parte de uma estratégia de *Blended Learning*. Os autores vêem inovações nas tecnologias de *e-learning* que levarão a uma revolução na educação, permitindo que a aprendizagem seja individualizada sob a forma de um método de aprendizagem mais adaptativo que aumenta as interacções entre os aprendentes com outros num contexto de aprendizagem mais colaborativo e que transforma o papel do professor.

Este aspecto social é também descoberto por Aspden e Helm (2004) num estudo dos *virtual learning environments - VLE* (ambientes de aprendizagem virtual) num *campus*. Estes autores descobriram que o uso de VLEs poderia alterar as dimensões das relações de aprendizagem e de ensino existentes. Os mesmos mencionam ainda que a a literatura de investigação respectiva indica que um maior envolvimento com tecnologias educacionais pode ter o efeito de aproximar o pessoal e os estudantes, tanto física como vir-

tualmente, em vez de encorajar as instituições com campus a disponibilizarem mais informação à distância. Estes autores explicam de que forma os estudantes do campus podem beneficiar do uso adequado da tecnologia de formas que os façam sentir cada vez mais ligados à sua instituição e aos seus colegas. Usando dados qualitativos eles exploraram o modo como o uso eficaz das tecnologias poderia ajudar a estreitar a distância entre os estudantes, a sua instituição e os seus colegas, ainda que as interacções reais entre os estudantes ocorram *offline* – e como a combinação de ambientes de aprendizagem físicos e virtuais poderiam ser usados para criar uma experiência de aprendizagem e de ensino eficaz. A questão sobre como a comunicação social e as comunidades praticantes podem melhorar a aprendizagem também é examinada por Motteram (2006) no seu estudo sobre o papel do *Blended Learning* na educação de professores num programa de mestrado na Universidade de Manchester. As comunidades praticantes foram uma forma de percepcionar a experiência dos estudantes usando uma série de ferramentas online. A experiência foi particularmente relevante e ajudou-os a usar tecnologias educacionais na sala de aula de línguas.

Um outro projecto que se foca no efeito de aprendizagem positiva da interacção e comunicação dos estudantes foi realizado por Guldberg e Pilkington (2006). Através da análise de uma amostra de discussões *online* os autores estudaram o desenvolvimento dos *aprendentes* adultos como profissionais que reflectem sobre o seu trabalho, numa comunidade de aprendizagem em rede. A sua análise demonstra que os estudantes pertencem a uma comunidade de profissionais com subconjuntos diferentes, tais como estudantes que são pais e assistentes de pessoas com ASD (perturbações do espectro autista) que trabalham em conjunto na partilha e construção de conhecimentos comuns. Este discurso partilhado e noções comuns do que é boa prática ajudaram a criar um espaço seguro de interacção para os estudantes. Assim que a identidade do grupo se consolidou emergiram mais questões desafiantes e o grupo estava capaz de definir outros valores, percepções e objectivos comuns através de processos de resolução.

Em contradição com as descobertas de Aspden e Helm (2004) e de Guldberg e Pilkington (2006), Welker e Berardino (2005) descobriram, a partir de um estudo dos estudantes da State University of New York Institute of Technology, que a interacção social reduzida a par de confusão e mais trabalho são desvantagens de um curso de *Blended Learning*. Os resultados do estudo não são totalmente negativos porque os estudantes também mencionaram vantagens como flexibilidade, conveniência e independência em conjunto com um ganho económico para os estudantes, visto que o ensino e a ajuda financeira se mantêm inalterados enquanto que os gastos em tempo e viagens foram reduzidos.

A questão sobre como as comunidades de estudantes e a comunicação social podem melhorar a aprendizagem tem sido um campo de estudo no âmbito da teoria da aprendizagem durante anos. O foco na tecnologia neste caso é estudado no âmbito da CSCL - computer supported collaborative learning (aprendizagem colaborativa com apoio computadorizado).

Investigação académica e projectos relacionados com a didáctica e as estratégias de aprendizagem

A questão didáctica é claramente um assunto sempre que o ensino está em foco. O método de *Blended Learning* terá um impacto nas soluções didácticas e nas estratégias de aprendizagem dos estudantes. Taradi et al. (2005) analisaram um projecto de disponibilização de serviços educacionais para o segundo ano de um curso de Licenciatura em Fisiologia Ácido-Base. Para apoiar o *PBL* foi criado um bom ambiente educacional na Internet usando o programa *Web Course Tools*. O curso está preparado de forma que os estudantes tenham que trabalhar em grupos pequenos colaborativos usando actividades de resolução de problemas para desenvolver a compreensão dos assuntos. O objectivo desse estudo é identificar o impacto do ambiente híbrido colaborativo *WBL-PBL* nos resultados dos estudantes. Os resultados dos testes dos estudantes e do inquérito de safisfação obtidos por um grupo de teste em *WBL-PBL* foram comparados com os de um grupo de controlo cujas oportunidades de aprendizagem se resumiam a um

modelo tradicional de *PBL* em sala de aula. Os alunos WBL tiveram pontuações significativamente melhores no teste final sobre *acid-base physiology* e demonstraram um comportamento positivo em relação ao novo ambiente de aprendizagem nas suas respostas no inquérito de satisfação. Em comparação, a média do grupo em causa (WBL) está no percentil 76 do outro grupo (regime presencial), o que equivale a uma dimensão média de impacto. Deste modo o progresso dos estudantes no ambiente colaborativo *WBL-PBL* obteve um impacto positivo pelo uso da tecnologia.

Romano et al. (2005) mencionam como o crescimento da educação à distância aumenta a necessidade de analisar as estratégias de aprendizagem dos estudantes em ambientes remotos e de Blended Learning . Os autores mediram e compararam o estudo "de última hora" dos estudantes versus os comportamentos de revisão espaçada nas apresentações realizadas e examinaram a sua relação quanto à conclusão do curso e aos comportamentos durante um período. Apesar de a teoria prever que o estudo espaçado em vez do estudo "de última hora" resultaria em resultados mais elevados, os investigadores relatam descobertas diferentes em ambas as áreas. Foram divididos cento e cinquenta e sete estudantes à distância e formatos de cursos combinados em 5 grupos, com base nos seus padrões de estudo ("de última hora"/de revisão espaçada), uma semana antes de cada um dos 3 testes finais. Foram observadas diferenças significativas nos comportamentos de estudo ("de última hora"/de revisão espaçada) entre apresentações e cumprimento de objectivos e comportamentos.

Outro projecto sobre estratégias de aprendizagem é o de Nuckles et al. (2004). Estes autores estudaram o uso de registos de aprendizagem diária para descobrir as reflexões dos estudantes sobre as suas experiências de aprendizagem e resultados ao longo dos seminários na universidade. A escrita dos diários foi auxiliada por um programa designado eHELp. Esse programa ajuda no registo de diários de aprendizagem mais sofisticados através da modelação e escalonamento das fases de planeamento, produção e revisão. Para além disso, esses diários foram publicados, sendo importados para a plataforma de cooperação, de modo que os aprendentes podiam ler e discutir os diários dos seus colegas. Os autores descobriram que a principal função de tais diários públicos de aprendizagem é enriquecer os cursos universitários tradicionais com actividades adicionais de Blended Learning que impliquem reflexão elaborativa, organizacional e crítica, bem como actividades metacognitivas, de modo a promover um processamento mais profundo e uma melhor retenção dos conteúdos a ser aprendidos.

Num outro projecto Yeh et al. (2005) tinham como objectivo descobrir a relação entre os registos de aprendizagem e o efeito de aprendizagem num ambiente de *blended e-learning*, através de análises de regressão múltipla. Os registos de aprendizagem incluíam as notas dos testes online, o tempo de leitura, o número total de acessos e o número total de discussões *online*. A aprendizagem definiu-se como a nota total em dois exames mensais e num exame final. Para recolher dados de registo de aprendizagem foi criado um sistema de *e-learning* que integrava a função de compilação de dados nas actividades de aprendizagem com um módulo de gestão de materiais de ensino de modo a que os registos de aprendizagem de todos os aprendentes fossem registados automaticamente. Com este sistema foi conduzida uma experiência na criação de um programa de um curso num liceu local. Os resultados foram diferentes daqueles obtidos num ambiente "puramente" de *e-learning* e o desempenho nos trabalhos de casa *online* foi a única coisa que de facto contou significativamente para a aprendizagem, o que é um resultado naturam da aprendizagem do conhecimento processual.

Gynther (2005) nota que a maior parte das instituições que disponibilizam ensino em rede na Dinamarca fazem-no sob a forma de comunidades de prática e redes informais. Na Holbaek College of Education foi realizado um projecto em cooperação com os alunos para desenvolver, testar e implementar alguns princípios didácticos: 'Que tipo de conhecimento devem os alunos obter e que sob que tipo de forma pedagógica será necessário organizar o ensino?', 'Como é que deve ser organizada a sala de aula?', 'Como é que deve ser organizado o ambiente de aprendizagem?', 'Que tipo de recursos de aprendizagem se podem criar com base nas suas escolhas?'.

O grupo de alunos foi constituído com pessoas que normalmente não teriam possibilidade de fazer um curso presencial. Gynther descobriu que os alunos reagiram de forma muito positiva à flexibilidade que tinham no curso. As conferências virtuais foram usadas como canal de armazenamento e de distribuição. As notas do exame mostraram que os resultados eram melhores do que os dos alunos que frequentaram o curso em suporte tradicional. Gynther descobriu ainda que de modo a conseguir o envolvimento dos alunos tinha que haver alguns processos específicos: processos de participação, de "terem algum significado", de envolvimento mútuo, de objectivo comum, de partilha de conhecimentos.

Investigação académica e projectos relacionados com os aspectos organizacionais na aprendizagem

O aspecto híbrido tem tanto um impacto organizacional, como didáctico. A partir do momento em que a aprendizagem é parte de uma instituição, os métodos usados para o ensino também têm um impacto organizacional. Boeker e Klar (2006) descobriram que os aspectos didácticos e organizacionais determinam o sucesso que o *e-learning* disponibiliza e influenciam também o desenvolvimento em geral do *e-learning* mais do que as características técnicas. Estes autores explicam de que modo o *e-learning* tem sido usado na educação e formação de médicos em diversos tipos: linear, sequencial e apresentações e textos, tutoriais e simulações em formato de hipertexto. Os sistemas de *e-learning* com base em casos são de especial importância na Medicina porque permitem a mediação do processo e o conhecimento prático através da apresentação de casos médicos autênticos num ambiente simulado.

A integração do *e-learning* na educação médica e na formação profissional avançada é crucial para o seu sucesso a longo termo. Nos sistemas com base em casos isto pode ser alcançado através de abordagens de *Blended Learning* que combinam elementos de ensino tradicional com *e-learning*. Os LMS - learning management systems (sistemas de gestão da aprendizagem) suportam a integração do ensino tradicional e do e-learning ao servirem como uma plataforma de organização dos conteúdos para ensino.

Para além disso, eles disponibilizam meios de comunicação para formadores e formandos, ferramentas de criação de conteúdos, componentes interactivos, gestão do curso e um conceito baseado em papéis partilhados. Os autors descobriram que a disseminação do *e-learning* pode ser incrementada se se tomar em atenção os requisitos e a análise de utilizadores, se cedo se adoptar estruturas organizacionais, integração curricular e cooperação contínua com os alunos.

Um outro impacto organizacional - e talvez a ameaça principal para as organizações ao implementarem a tecnologia na instituição - é a possibilidade de ter mais alunos inscritos e simultaneamente reduzir o tempo dispendido pelo pessoal da organização. Cottrell e Robison (2003) descrevem o caso de um curso de contabilidade com muitas inscrições na Universidade de Brigham Young (Utah).

O caso de estudo foca-se na possibilidade de usar abordagens híbridas para reduzir o tempo de ocupação do pessoal, redireccionar o tempo dos alunos e levantar a possibilidade de usar o *Blended Learning* como uma forma de admitir mais alunos num programa académico.

Tal como acima mencionado, Welker e Berardino (2005) estudaram o resultado do uso de *Blended Learning* no Institute of Technology da State University of New York. As respostas do pessoal revelaram que o envolvimento é um factor principal no uso cada vez maior deste tipo de cursos; a qualidade dos testes e as notas dos cursos que são tão boas ou melhores; e os cursos que implicam produção melhorada de conteúdos e discussões. A tecnologia de gestão do curso e recomendações para criação de cursos foram disponibilizadas ao pessoal para consideração. Os resultados mostram que enquanto que o curso era fácil de usar do ponto de vista do seu aspecto visual, o pessoal declarou todavia ter tido mais trabalho e a perda de algumas dinâmicas tradicionais da sala

de aula.

As soluções híbridas podem ter também um impacto organizacional na localização dos alunos e podem resolver a questão relacionada com a dimensão do tempo e do espaço. O aparecimento de aulas de aula interculturais tem aumentado constantemente nas instituições terciárias australianas devido ao número cada vez maior de alunos de diferentes culturas que se têm inscrito para concluir os seus cursos. A investigação sugere que os alunos de diferentes culturas demonstram compatibilidade variada conforme os ambientes de aprendizagem. Lanham e Zhou (2003) explicam como o aumento no número de alunos internacionais significou uma alteração na demografia estudantil e o reconhecimento das diferenças nos estilos de aprendizagem dos alunos. Em virtude disso, é necessária uma abordagem mais flexível na apresentação de conteúdos para formandos. Os autores sugerem que de modo a assegurar que todos os alunos estão disponíveis para participar neste domínio é necessário preparações para acolher todas as culturas.

Em síntese

O *Blended Learning* tem natureza diversa e investiga diversos aspectos diferentes do processo e dos ambientes de aprendizagem. Este capítulo fez a revisão do *Blended Learning* de quatro diferentes pontos de vista: em primeiro lugar, em relação a projectos nos quais a integração da tecnologia no ensino foi um dos objectivos principais; em segundo, quanto aos projectos nos quais a experiência de aprendizagem foi o foco principal; em terceiro, quanto às consequências didácticas; por fim, quais alterações organizacionais, como resultado do *Blended Learning*, foram o aspecto principal. De acordo com cada um destes quatro aspectos relatam-se diferentes descobertas.

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Exemplos de *Blended Learning* usados na prática comercial

Introdução

O *Blended Learning* é mais conhecido como uma integração combinada de ensino tradicional com abordagens *online* baseadas na Internet. Também é frequentemente entendido como a combinação de meios e ferramentas aplicadas num ambiente de *e-learning* enquanto que outros autores o interpretam como a combinação de uma série de abordagens pedagógicas, independentemente da tecnologia usada (Whitelock & Jelfs 2003). Por um lado, este capítulo apresenta modelos de *Blended Learning* de alguns autores interessados na sua prática comercial. Por outro, introduz alguns exemplos da implementação do *Blended Learning* na indústria.

Modelos na prática comercial

Enquanto muitos autores usam o *Blended Learning* como uma ferramenta para investigar o uso no âmbito da aprendizagem, outros autores estão interssados no verdadeiro uso do *Blended Learning* na indústria e na sua prática comercial. Esses autores vêem o B*lended Learning* como uma combinação integrada de ensino tradicional com modos de apresentação online com base na Internet. Thorne (2003) – tal como mencionado nos capítulos anteriores – escreve livros baseado numa audiência com interesse em implementar o *Blended Learning* como um método de formação no sector empresarial e no industrial.

Thorne vê o *Blended Learning* como um modo de tornar a aprendizagem mais individualizada e refere-se ao teórico Howard Gardner mencionando o facto de como as pessoas respondem positivamente a diferentes estímulos de aprendizagem. Deste modo as organizações e as escolas podem oferecer diversas formas de trabalho, baseadas em informações múltiplas.
Do modo que Thorne (ibid) vê este assunto, uma das verdadeiras vantagens do *Blended Learning* é a oportunidade de ser mais focado e específico no que se refere è necessidade de aprendizagem. O *Blended Learning* possibilita a adaptação do ensino aos indivíduos em vez de usar uma abordagem igual para todos. A partir daqui ele elabora uma lista de sete pontos que ajudam a identificar as necessidades básicas:

1. Definir o nível de necessidade/prazo. A própria natureza híbrida deste modelo baseia-se na flexibilidade.
2. Reconhecer diferentes estilos de aprendizagem. Reflectir na questão sobre de que modo os alunos fazem as coisas de modo diferente toma em consideração os diferentes estilos de aprendizagem preferidos.
3. Olhar de forma criativa para o potencial de usar diferentes formas de aprendizagem, ou seja fazer corresponder a necessidade de aprendizagem a diferentes métodos de apresentação e identificar aquele que melhor se adapta. A integração do *Blended Learning* representa uma oportunidade de pegar no que existe e evoluir para uma dimensão diferente usando as novas tecnologias – apresentando ao aluno uma série ampla de opções.
4. Trabalhar com os actuais fornecedores internos e externos na identificação dos objectivos de aprendizagem e para assegurar que aquilo que está planeado corresponde às necessidades reais (no caso de se tratar de uma universidade isto já deverá ter sido feito. No caso de se tratar de um novo assunto, isto tem que se efectuar).
5. Empreender um processo educacional e desenvolver uma demonstração amigável destinada ao utilizador para ilustrar o potencial do *Blended Learning*
6. Estar preparado para disponibilizar apoio aos utilizadores
7. Preparar um processo de monitorização para avaliar a eficácia da apresentação (Thorne 2003: 36 ff).

Para além disso, Thorne vê vários benefícios baseados no tipo de meio em que os conteúdos estão disponíveis:

- A turma não tem que estar à espera enquanto que o formador ajudam alguns formandos a compreender alguns conhecimentos básicos
- Os formandos têm a possibilidade de apreender os conteúdos básicos ao seu próprio ritmo.
- Pode-se recorrer várias vezes à intranet / internet para apoio adicional
- Pode-se disseminar a uma audiência mais vasta
- Pode-se disponibilizar uma ampla série de materiais de formação aos formandos
- Se os formandos faltarem um dia podem sempre recuperar o atraso recorrendo aos pacotes multimédia
- Poupança de tempo e custos em viagens
- Possibilidade de criar turmas virtuais cujos elementos estão dispersos geograficamente
- As lições e as actividades podem ser estudadas antes das sessões presenciais ou das actividades em sala de aula libertando tempo para se realizarem actividades mais práticas na sala de aula.
- Pode-se criar cursos individuais que suplementam a formação e os exames presenciais
- Corta-se nos custos devido à poupança de tempo dispendido no apoio aos utilizadores
- A aprendizagem pode ser mais direccionada, focada, de um modo mais eficaz para o formando (*just-in-time*)
- Os formandos podem interagir com os formadores e com os colegas. (Thorne 2003).

Um outro teórico adepto desta tradição é Bersin (2004), que afirma que desde o advento dos computadores nos anos 60 as organizações têm vindo a tentar aplicar a tecnologia aos processos de aprendizagem e de formação. Ele considera que a primeira abordagem de formação com base tecnológica surgiu com monitores e mini-computadores nos anos 60 e 70 e menciona um sistema pioneiro designado de Plato, que foi desenvolvido em 1963 pela Control Data na Universidade de Illinois. O Plato foi pioneiro no uso de computadores em ambientes educacionais tradicionais e ainda existe hoje em dia. Bersin conclui que existem duas abordagens genéricas ao Blended Learning :

1. Modelo de “program flow”: um currículo passo-a-passo que integra vários meios num programa cronológico ou programa de estudos. Os capítulos baseiam-se uns nos outros. Termina com um exercício ou avaliação para avaliar a aprendizagem total.
   A primeira abordagem cria tanto um elevado nível de empenho como uma alta taxa de conclusão. Por esse motivo os alunos sentem-se mais empenhados e podem planear a sua formação ao longo do tempo. Esta abordagem também permite aos alunos terem tempo para adaptar a sua formação aos seus compromissos e ao mesmo tempo obriga-os a continuar o programa até o concluirem. Esta abordagem permite que os professores vão acompanhando o progresso dos alunos e se algum desistir ou faltar é possível saber exactamente em que parte é que existem problemas e descubram alguns problemas pontuais. É adequada ao ensino em sala de aula que correponde à maior parte das expectativas das pessoas. Muitos formandos foram habituados a aprender desse modo nas suas carreiras académicas durante semestres e anos. Este é portanto o modelo que a maior parte dos conteúdos usam e que se adapta à maior parte dos paradigmas educacionais (aprender/tentar/avaliar). É adequado para um programa de certificação e é fácil de modificar e de manter.

2. O modelo “core-and-spoke”: uma abordagem principal de formação (em sala de aula ou em ambiente virtual) com outros materiais, interactividades, recursos e modos de avaliação considerados como “materiais de apoio, opcionais ou obrigatórios” que circundam e complementam a primeira abordagem.

Esta segunda abordagem está concebida como um único curso que usa um único meio (electrónico ou presencial) e que usa outros meios ou actividades de aprendizagem como material opcional ou suplementar. A principal diferença entre esta abordagem e a anterior é que os materiais suplementares são opcionais e não têm prazo associado. Os alunos decidem por si próprios que material suplementar vão usar e não precisam de concluir o curso em simultâneo. Usar material de referência é uma forma fácil de construir um modelo deste tipo. De uma forma geral é mais fácil avançar em fases com esta abordagem. Se construir o programa completo pode publicá-lo de imediato e acresecentar os materiais suplementares ao longo do tempo. Mas esta abordagem parte do princípio que os alunos são formandos independentes e motivados.

Este modelo agiliza o processo de desenvolvimento porque a organização que providencia a formação pode preparar os materiais suplementares ao longo do tempo. O material falado pode ser tornado mais importante com exercícios e eventos e ser especializado para necessidades específicas. Este modelo é eficaz quando os formandos são pessoas motivadas e experientes e já especialistas. Dá-lhes a possibilidade de escolher os meios e os recursos para o sucesso.

Como é que se pode seleccionar qual o modelo híbrido correcto? Bersin faz uma lista de oito critérios para seleccionar o modelo de *Blended Learning*:

- Tipo de programa: orientado por necessidades de negócio tais como os custos. Se o problema for um assunto de formação e não um assunto de gestão e tiver impacto na gestão.
- Objectivos culturais: criar relações, associações e valores partilhados.
- Audiência: dimensão, competências de acesso ao nível da tecnologia educativa, motivação para aprender, motivação pessoal, tempo.
- Orçamento: desenvolvimento.
- Recursos: tempo, dinheiro e pessoal. Tempo para disponibilizar e completar o programa e os seus conteúdos.
- Conteúdos de aprendizagem: complexidade e interactividade.
- Tecnologia: normas, plug-ins, largura de banda, monitor, segurança.
- O que tem impacto no custo do programa: dimensão total da audiência.
- Selecção dos meios: internos ou subcontratados.

Para além disso, sugere-se o modelo seguinte de combinação de meios diferentes de ensino:

Modelo	**Características**
Auto-estudo em modo e-learning com outros meios ou eventos combinados	Um curso de auto-estudo com programa central de aprendizagem. O formando acede a vários elementos multimédia que fazem parye de um curso online do tipo *core-and-spoke*
Programa com tutor combinado com auto-estudo em modo e-learning	O *e-learning* usado como pré-requisito, as actividades são realizadas durante e entre aulas
Live e-learning como modo principal, acrescido de outros meios	*Webinars*, eventos de *e-learning*, auto-estudo
Formação on-the-job	Formação no local de trabalho com instrutor
Simulações e laboratórios como modos principais	Formação em tecnologias de informação e em aplicações na qual pode ser simulado todo um ambiente

(Bersin 2004: 85)

O modelo pode funcionar para combinar o ensino tradicional e a tecnologia tanto em universidades tradicionais como nos locais de trabalho. O autor lista quatro exemplos de formação nas empresas:

Tipo 1: Comunicação de informação
Típico e-learning ou interactividades de formação: Ler, ouvir e ver
Típicos meios combinados: audioconferência, *webinar*, correio electrónico ou *newsletter*

Tipo 2: Transferência de capacidades críticas
Típico e-learning ou interactividades de formação: Ler, ouvir, ver e perguntar e responder a questões
Típicos meios combinados: apresentações em PowerPoint, *live e-learning webinar*, verificação da conclusão mas sem notas

Tipo 3: Capacidades e competências
Típico e-learning ou interactividades de formação: Ler, ouvir, interagir, praticar, perguntar, interagir com outros, fazer um exame e obter resultado
Típicos meios combinados: curso em suporte na Internet, aulas com instrutor, audioconferência, laboratórios locais, simulações

Tipo 4: Certificação (tipificada ou segundo uma norma)
Típico e-learning ou interactividades de formação: ler, ouvir, interagir, praticar, responder a questões, fazer um exame, obter resultado, passar ou reprovar
Típicos meios combinados: curso em suporte na Internet, aulas orientadas por um instrutor, audioconferências, laboratórios locais, simulações, testes internos ou externos, acompanhamento da conclusão e da expiração de prazo através de LMS.

Outra coisa importante no uso do *Blended Learning* num programa é a dimensão de acompanhamento e de informação que é necessária. O acompanhamento refere-se à tecnologia e aos processos para aferir o envolvimento, as actividades, a conclusão, as notas, a certificação e a satisfação com o programa.
Os requisitos do negócio determinam qual o nível de acompanhamento e de informação que é preciso numa empresa. A experiência tem demonstrado que as pessoas não fazem mais do que 1 a 2 horas de auto-estudo por semana, a menos que esteja explicitamente agendado no seu programa de trabalho. As sugestões de Bersin é que quando se conhece o problema do negócio – quando se tem uma ideia da estratégia de programa e um orçamento adequado – deve-se criar e desenvolver o programa. Tem que se encontrar os meios mais adequados ao problema, à audiência e ao orçamento em causa (Bersin 2004).

Outros autores que teorizam sobre modelos de *Blended Learning* para empresas são Semler (2001) e Troha (2002). Semler (ibid) descobriu que combinando métodos de aprendizagem online com a formação em sala de aula reduz o tempo das sessões de formação e permite que os formandos levem a formação para onde quer que vão. Ele sugere algumas técnicas relativamente simples para ajudar a converter cursos em apresentações híbridas. Existem três grandes objectivos nesta actividade: 1) aumentar o impacto da aprendizagem, 2) aumentar a satisfação dos formandos e a facilidade de uso e 3) reduzir o custo total da formação. Ao centrar o tempo do curso que é passado em sala de aula na prática das capacidades e na sua aplicabilidade, o impacto da aprendizagem pode ser aumentado.

Os formandos também podem explorar e trabalhar os conteúdos sempre que lhes seja conveniente. Ao disponibilizar partes de um curso em regime de auto-estudo online, a duração das sessões presenciais, a apresentação a isso associada e os custos com viagens

podem ser reduzidos. Troha (ibid) disponibiliza um modelo que tem o intuito de guiar o leitor e a sua equipa através do processo de criação de *Blended Learning*. Graças às suas verificações e equilíbrios fica virtualmente assegurado um bom resultado. A acompanhar o modelo existe uma lista de secções para um documento sobre a criação do curso que – tal como é desenvolvido e esclarecido – gera um documento de discussão vital e um ponto central para todos aqueles que estiverem envolvidos no projecto. Essa lista contém os seguintes pontos: título do curso, objectivos gerais, público-alvo, duração, pré-requisitos, objectivos de aprendizagem, limitações, índice de conteúdos e de actividades de aprendizagem, transferência de estratégia de aprendizagem e estratégia de avaliação das fontes dos conteúdos.

Alguns destes livros dão exemplos sobre como o *Blended Learning* está integrado em diferentes empresas. Segue-se uma introdução a alguns desses exemplos.

Exemplos da formação na indústria

O *Blended Learning* é um modelo muito divulgado no mercado dos EUA, ao contrário do que acontece na Europa. A investigação confirma que a tecnologia tem uma baixa utilização actualmente nos programas de desenvolvimento de liderança na maior parte das organizações. Os factos mostram que existe um uso crescente, mas os investigadores não prevêem uma alteração rápida e dramática porque a rápida mudança tecnológica não implica necessariamente a sua imediata adopção, a menos que a cultura seja conducente ao uso da tecnologia. Mas um número de forças orientadoras poderão provavelmente impulsionar a adopção da tecnologia nesses programas, tais como:

1. Portais de liderança
2. Simulações para a aprendizagem interactiva e experimental – frequentemente em formatos híbridos e
3. Conteúdos abundantes

Os autores afirmam que à medida que a tecnologia se torna mais amigável e fácil de usar irá encontrar novas aplicabilidades no desenvolvimento de liderança (Trondsen 2006).

Brennan (2004) é de opinião que a disponibilização da formação *online* (ou seja, o *e-learning*) tem ultrapassado a sua primeira fase de adopção e que as empresas descobrem que quanto mais tempo a usarem, mais a usarão. A mensagem de corte nos custos foi eficaz em promover o seu crescente uso como uma ferramenta à disposição dos profissionais da formação. Todavia esses profissionais deveriam admitir que as poupanças de custos não se perpetuam por si só e que deveriam focar as suas energias em aumentar o valor dos seus serviços para a missão da empresa disponibilizando conteúdos de modo eficaz e efficiente que apoie tanto os objectivos da organização como os objectivos dos indivíduos.

Tem havido um rápido aumento no envolvimento dos sindicatos (trade union) com as TIC para apoiar tanto o desnvolvimento da equipa de aprendizagem/trabalho vocacional, como a educação dos sindicatos.A maior parte das confederações europeias e muitos sindicatos individuais têm agora algum nível de envolvimento com a tecnologia e o ensino e podemos começar a aprender a partir das abordagens e experiências de cada um.

Entre Junho e Outubro de 2004 foram realizados seis estudos de caso em conjunto com um inquérito online. Havia cinco estudos de caso de Itália (Confederazione Italiana Sindicati Lavoratori), Alemanha (Deutscher Gewerkschaftsbund Bildungswerk (DGB)),

Holanda (Federatie Nederlandse Vakbewegingen), Suécia (Landsorganisationen i Sverige) e Reino Unido (Trades Union Congress) e um estudo de caso transnacional da European Trade Union College (ETUCO). Estes casos mostram algumas das diversas formas através das quais os sindicatos estão a abordar o uso das TIC para apoiar a aprendizagem formal e informal, a formação vocacional e dos sindicatos, *Blended Learning*, aprendizagem organizacional e auto-aprendizagem; e aprendizagem nacional e transnacional. Estes estudos de caso revelam uma série de abordagens ao uso das TIC no ensino em sindicatos que reflecte uma variedade de prioridades e respostas organizacionais em contextos nacionais particulares. Ambientes industriais diferentes, culturas sindicais, políticas nacionais de governo e experiências iniciais com as TIC no ensino estão entre os factores que contribuem para esta diversidade (Creanor e Walker 2005).

Bersin (2004) menciona um exemplo da General Motors. Esta empresa confia muito na formação baseada em vídeo para formar os seus comerciais. O comité CBT da indústria da aviação desenvolveu a abordagem mais útil e amplamente implementada para inscrição, acompanhamento, informação e criação de conteúdos electrónicos favoritos. As normas AICC foram integradas em quase todos os cursos e em cada LMS disponível no mercado actualmente. Hoje o SCORM (*Sharable content object reference model*) um superset de AICC, está lentamente a tornar-se a nova norma para pacotes de conteúdo e interoperabilidade. O SCORM baseia-se em AICC e acrescenta conceitos tais como possibilidade de reutilização, sequenciamento e metadados pesquisáveis.

A alternativa europeia ao modelo SCORM é o modelo IMS-LD (*Learning Design*) que foi investigado e desenvolvido pelo grupo Dutch Valkenburg. Este modelo introduz formas normalizadas para descrever as actividades de aprendizagem tanto no ambiente electrónico (computador) como no presencial, o que tem sido uma das lacunas do SCORM. Disponibilizar ferramentas e técnicas para criar actividades de *Blended Learning* tais como aprendizagem com tutor, *e-learning* e abordagens colaborativas *online* e em reuniões presenciais é a característica forte do modelo IMS-LD. Isto torna esta abordagem IMS-LD viável para tecnologias e métodos de aprendizagem híbrida (Koper e Tattersall 2005).

Quando uma grande multinacional de petróleo decidiu reformular a sua formação inicial de engenharia sobre práticas com petróleo percebeu que a socialização era crítica para o sucesso desse programa. O seu programa híbrido, que durava meses, usava actividades *online* e presenciais numa estrutura mista. O programa incluía auto-aprendizagem, módulos com base na Internet, instrução em sala, conversa síncrone online e avaliações *online*. Os formandos estavam localizados em diversas partes do mundo mas encontravam-se numas instalações de formação no final do programa, onde podiam reforçar presencialmente a comunidade cultural que tinham criado online. Quando se incorporou o *Blended Learning* num programa de estudo foi preciso reflectir sobre a importância de se desenvolver um sentido de cultura e de experiência social nesse programa (Bersin 2004:43f).

Uma outra empresa que distribui produtos industriais pretendia encontrar uma nova forma de conseguir que os atarefados representantes de vendas de telefones fizessem formação *online* sobre uma nova versão de um sistema SAP. O último curso online tinha sido um desastre porque as pessoas estavam demasiado ocupadas para fazer essa formação. Isto era um problema porque essa empresa pretendia que todos os colaboradores fossem completamente formados no sistema antes que ele entrasse em funcionamento. Mas não só as pessoas estavam demasiado ocupadas; também não havia tempo durante o desenvolvimento do software para permitir que as pessoas praticasssem. A empresa decidiu centra-se nos factores culturais e criou um programa híbrido. Começaram com uma série de audioconferências e reuniões locais organizadas pelos coordenadores regionais. Cada coordenador aproximou as pessoas e criou um "contexto social" local para a formação. Ao acrescentar a socialização e a presença local ao programa os resultados da aprendizagem demonstraram ser três ou quatro vezes melhores do que aqueles que tinham sido obtidos no programa de *e-learning* anterior (Bersin 2004:44f).

Tal como abaixo descrito, Bersin apresenta o modelo de "fluxo do programa" e o modelo "core-and-spoke". Nesta secção Bersin indica exemplos de empresas onde os diferentes modelos estão em uso:

O modelo de "fluxo do programa":

Ex.1
Roche Pharmaceuticals criou um programa para ensino do seu sistema SAP de processamento de encomendas. Uma das lições aprendidas nestes programas é que a formação em processos é tão importante quanto a formação em aplicações. A empresa teve que o rever e desenvolver um módulo presencial que incluísse imagens e diagramas em *Whiteboard* para explicar o processo de negócio a partir de uma perspectiva funcional. Foi depois desta situação que o modelo de *Blended Learning* começou a dar resultados.

Ex. 2
A empresa BT tinha um novo produto para ser lançado no mercado e pretendia fazer um curso de formação mas descobriu que os seus colaboradores iriam gastar muito tempo para abordar todos os tópicos. Por esse motivo decidiram iniciar um projecto de *Blended Learning* começando com uma audioconferência antes de iniciar o programa de *e-learning* de 2 horas, uma audioconferência orientada por um instrutor para responder a questões, um segundo programa de de *e-learning* de 2 horas e finalmente um evento de 1 dia orientado por um instrutor com prática real. Desta forma eles conseguiram reduzir o tempo inicialmente previsto.

Ex.3
Um importante banco americano tinha cada ano 2.400 novos colaboradores para formar. Antes do programa de *Blended Learning* ter sido introduzido a empresa usava um curso que demorava seis semanas a ser completado. O objectivo do novo programa era reduzir o tempo dispendido para quatro semanas. A equipa responsável pelo programa de *Blended Learning* desenvolveu uma série de cursos de formação baseados na Internet com diferentes cenários, simulações, desempenho de papéis, discussões de grupo e sessões informativas com o director. O programa demorou quase 12 meses a ser desenvolvido, mas teve excelentes resultados e os facilitadores comentaram que os formandos mencionaram que tinham o mesmo nível de mestria que tinham tido após cinco semanas de frequência do programa anterior.

Ex.4
Em 2001 a empresa CAN Insurance precisava de desenvolver um processo de planeamento do desempenho inteiramente novo para mais de 2.000 directores antes do final do ano. Os esforços efectuados em ambiente de *e-learning* no passado tinham sido desapontadores devido ao baixo número de inscrições e à falta de interesse. A nova abordagem era o *Blended Learning*. A empresa implementou uma inovadora plataforma baseada na Internet que permitia aos formandos aceder ao ambiente de formação híbrida. Nesse ambiente cada aluno era membro de uma cadre, que é uma equipa de quinze a trinta pessoas que trabalham num programa no mesmo horário, pontuam os exercícios uns dos outros e interagem através do programa. Para além disso tinham um formador online que também era tutor, conselheiro e assistente do professor. Através da plataforma foi criado um *Blended Learning* de elevado impacto e tanto a satisfação dos formandos como o impacto no negócio subiram exponencialmente (Bersin 2004: 36ff).

O modelo "core-and-spoke":

Ex.1
Num programa de formação de engenheiros de produção de semicondutores o programa de *Blended Learning* combina componen-

tes *online* com sessões práticas em laboratório. Deste modo nove dias de aulas foram reduzidos para dois cursos de dez horas cada em regime de auto-aprendizagem, seguidos de duas sessões de dezoito horas em laboratório e de um breve evento orientado por um instrutor para reforçar a informação, a prática e responder a questões que houvesse.

Ex.2
Um importante retalhista com 650 lojas em todos os EUA descobriu que o ensino à distância não era suficiente para aprender módulos sobre assuntos como "como vender HDTV", "compreender componentes stereo", etc. O resultado foi um programa do tipo "core-and-spoke" no qual foi introduzida uma lista de verificação para que os formandos circulassem pela loja, identificassem artigos e desempenhassem tarefas. Através desta simples tarefa a empresa melhorou o seu investimento no ensino à distância.

Ex.3
Rolls-Royce PLC
Desde 2000 que a Rolls-Royce PLC tem sido confrontada com requisitos de formação para apoiar uma importante implementação de um planeamento de recursos da empresa, envolvendo grandes alterações nos processos da empresa e a introdução do SAP como sistema de TI para apoiar os processos. Baseados nas melhores práticas, alteraram o modelo de formação, passando da formação em computador como pré-requisito para a formação orientada por um instrutor para formação *online*, na qual a formação com o instrutor reforçava as sessões *online* e onde o elemento presencial era um veículo para a comunicação em mudança e introduziu as lições *online* de modo a que os formandos ficassem preparados para o *workshop* posterior de aprendizagem *online*.

Em síntese

Este capítulo apresenta os modelos de *Blended Learning* de alguns autores que se interessam pela prática comercial do *Blended Learning*.
São descritos modelos sobre como combinar materiais e métodos educativos e também critérios para os escolher. São também disponibilizados exemplos do sector industrial e descrevem-se dois dos principais modelos para sequenciar conteúdos: o "program-flow" e o "core and spoke". São ainda dados exemplos de implementações bem-sucedidas de ambos os modelos, explicando-se também a lógica por detrás da decisão pelo modelo adoptado.

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Casos de *Blended Learning*

Introdução

CASOS DE *BLENDED LEARNING*

O objectivo desta parte do manual é apresentar diversos exemplos de como a abordagem do *Blended Learning* é usada no ensino superior em diferentes países. Os casos são cursos, módulos e programas verdadeiros nos quais o *Blended Learning* foi integrado de forma bem-sucedida nos currículos tradicionais comuns. Esses casos abranges exemplos não só das ciências tecnológicas, mas também das humanidades, das ciências sociais e da educação e das ciências da vida.

As 14 descrições de casos providenciam informação básica sobre o assunto, aspectos pedagógicos, uso de tecnologias, métodos de combinação e avaliação dos resultados em cada caso. Existe ainda um espaço para informação adicional e para contactos. Alguns dos casos são igualmente descritos em mais detalhe no EPPS.

SELECÇÃO DE CASOS

O processo de selecção dos casos baseou-se no princípio de "boas práticas", de modo que cada país parceiro enviou bons exemplos de como os cursos universitários tradicionais e as TIC foram integrados no ensino superior. Como pode ser concluído na parte teórica deste manual a definição de *Blended Learning* não é clara e a prática é ainda mais complexa e multidimensional. Por isso foi adoptada uma abordagem mais flexível e mais aberta na selecção de casos, para que não viessem a ser usadas regras estritas e defnições pouco abrangentes ao definir o que *Blended Learning* é bem como aquilo que não é. A única característica principal e comum a todos os casos é a de que todos aprensentam um curso ou módulo de nível universitário no qual o ensino tradicional presencial, seminários e aulas estão de algum modo integrados com o uso das TIC (tecnologias da informação e da comunicação).

Houve dois problemas óbvios ao seleccionar os casos. Em primeiro lugar *Blended Learning* (BL) não é uma designação comum em ambientes de ensino superior e em muitos locais os docentes e professores universitários usam na verdade o BL sem estarem disso cientes. Existe também uma longa história de ensino à distância (ED), especialmente nas universidades abertas e mesmo apesar de o ED não ser o mesmo que o BL, a fronteira entre os dois modos é muito vaga. Em segundo lugar, visto que o BL é mais ou menos uma designação relacionada com o ambiente dos negócios, as universidades não são verdadeiramente precursoras em aplicações de *Blended Learning* e por esse motivo muitas das inovações e bons modelos que têm sido disponibilizados noutros campos da educação não chegaram ainda ao ensino superior.

"MENTE ABERTA"

O principal propósito destes estudos de caso é encorajar os docentes, professores e as faculdades a fazerem experiências com as TIC de um modo inovador, para que também as organizações do ensino superior possam beneficiar das vantagens óbvias que as novas tecnologias disponibilizam para o ensino e para a aprendizagem. O primeiro passo pode ser tão simples como acrescentar uma discussão por correio electrónico à série tradicional de aulas, de modo a que haja mais interacção entre o professor e os alunos, bem como entre os alunos. Uma inovação mais recente, totalmente híbrida, seria por exemplo um curso em que a videoconferência, wikis, máquinas fotográficas digitais, telemóveis, etc., são usadas para facilitar seminários de investigação presencial onde os alunos podem estar presentes tanto físicamente como virtualmente. A tecnologia existe e também está frequentemente já disponível em muitas universidades e a um baixo custo (se não gratuita).

O único obstáculo – ou desculpa – para não usar as tecnologias modernas de aprendizagem é habitualmente a falta de imaginação que é frequentemente disfarçada como falta de tempo ou falta de aptidões. Esta última pode ser com frequência facilmente corrigida solicitando ajuda e apoio à unidade de tecnologias de ensino da universidade (sim, também deve haver uma destas unidades na sua universidade). E a longo prazo, uma combinação bem-sucedida dará ao professor mais tempo para se focar nas partes relevantes dos processos de ensino.

SUMÁRIO

Casos de Blended learning
Mostra de boas práticas

Análise de Dados II (Finlândia)

Nome do caso:
Data Analysis II

Universidade, departamento e país:
Universidade de Helsínquia, Faculdade de Ciências Sociais, Departamento de Matemática e Estatística, Finlândia

Contexto de estudo (nível de estudos, assunto):
Licenciatura; estatística aplicada

Público-alvo:
Alunos de segundo e terceiro ano da licenciatura em Ciências Sociais ou Comportamentais

Descrição:
O objectivo do curso de metodologia de análise de dados é aprender como (1) analisar dados empíricos e formular, estimar e avaliar modelos estatísticos como ferramentas de análise de dados e (2) apresentar problemas de investigação e resultados de forma clara usando métodos gráficos e outras ferramentas de apresentação estatística. Os requisitos do curso incluem 60 horas de ensino em pequenos grupos, uma parte das quais consiste em aulas e exercícios práticos em computadores. Os alunos preparam ainda apresentações dos seus exercícios e escrevem um relatório sobre o trabalho de curso. Este curso confere 10 ECTS.

Abordagem pedagógica:
Este curso é sobretudo baseado numa abordagem de aprendizagem construtiva, mais aproximada ao construtivismo cognitivo. Dá-se importância ao planeamento detalhado das actividades de ensino e de aprendizagem (Biggs 2003) e a construção activa da informação é o processo principal. O papel dos professores pode ser definido como um guia pedagógico. O ensino baseia-se em discussões e em questões levantadas pelos alunos, na resolução activa de exercícios, num espaço de trabalho partilhado e nas "pistas" que os alunos deixam/apresentam quando resolvem os seus exercícios. A ideia principal é aprender a partir das soluções e apresentações dos outros e partilhar o processo de aprendizagem.

Uso de tecnologias:
Página do curso na Internet e ambiente electrónico de aprendizagem BSCW. Todos os materiais do curso estão disponíveis na página do mesmo, incluindo as apresentações e exercícios dos alunos e os grupos de discussão.

Método de combinação:
O BSCW está muito integrado no curso; o método principal de ensino é ainda o de pequenas "aulas" em grupo que são baseadas em discussões e questões, mas o BSCW inclui todos os materiais, incluindo dados e apresentações para os trabalhos dos alunos. Por esse motivo a Internet é habitualmente usada como parte das sessões presenciais também (aulas, apresentações), não apenas como uma ferramenta adicional ou individual. A distribuição estimada de uso dos diferentes métodos é de 30% de aprendizagem na Internet, 30% de sessões presenciais e 30% de trabalho individual.

Conclusões e resultados da avaliação:
O uso do ambiente electrónico de ensino na Internet aumentou o trabalho colaborativo dos alunos e a partilha de informação e de ideias. Os resultados da aprendizagem são melhores do que no formato anterior. A opinião dos alunos é boa e o uso da Internet também reduziu a carga de trabalho do professor (mais respostas colectivas nos trabalhos, gestão e o professor deixa de o ser quando passa a ser um dos intervenientes nas discussões).
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Gestão de Informação e Desenvolvimento de Sistemas de Informação (Finlândia)

Nome do caso:
Information management and information systems development

Universidade, departamento e país:
Universidade de Jyväskylä, Departmento de Ciências da Informação, Finlândia

Contexto de estudo (nível de estudos, assunto):
Licenciatura; Gestão de informação e desenvolvimento de sistemas de informação

Público-alvo:
Alunos da licenciatura em Ciências da Informação

Descrição:
Os temas do curso de Gestão de Informação e Desenvolvimento de Sistemas de Informação são (1) visão administrativa sobre a gestão de recursos de informação, (2) visão tecnológica sobre a gestão de recursos de informação, (3) criação de sistemas de informação e (4) aplicações nas organizações. Este curso foi inspirado pelo livro *Information Technology for Management: Transforming Business in the Digital Economy* (Turban et al., 2002). Normalmente este curso dura sete semanas incluindo aulas (36 horas), trabalho de curso (estudo de praticabilidade) bem como um exame final. O curso híbrido disponibilizado no Outono de 2005 também teve a mesma duração e incluiu as actividades acima indicadas. Para além disso, havia material e actividades na Internet para apoiar as aulas. A ideia principal é a aprendizagem dos conceitos básicos das ciências da informação utilizando um seminário na Internet baseado na resolução de problemas. A ideia é a de que os alunos procurem por si mesmos todos os conceitos e assuntos nos materiais das aulas que considerem que estão pouco claros ou mal definidos.

Abordagem pedagógica:
Construtivista, combinando tanto o construtivismo cognitivo como o social construtivismo, bem como a aprendizagem baseada em problemas.

Uso de tecnologias:
Motores de pesquisa, processadores de texto e o ambiente electrónico de aprendizagem Optima.

Método de combinação:
Seminário baseado em problemas opcional e materiais de apoio na Internet, em paralelo com as aulas presenciais. O ambiente de aprendizagem na Internet (cerca de 25%) apoia as aulas (15%) e o estudo individual (60%).

Conclusões e resultados da avaliação:
Esta solução apoia a aprendizagem de formas diversas segundo o espírito do construtivismo cognitivo e social. Em primeiro lugar os alunos elaboram um relatório sobre o trabalho de curso que se centra nos problemas definidos por eles próprios sobre a área temática. Isto é feito usando motores de pesquisa e publicando o relatório na Internet. Em segundo lugar, no seminário na Internet os alunos podem familiarizar-se com os relatórios elaborados pelos seus colegas. Artigo de conferência disponível: Makkonen, P. 2006. Benefit of an optional problem-based seminar on the web: Comparing ways of learning on the web.

AMCIS Conference, http://amcis2006.aisnet.org/

Informação adicional e referências:

http://www.cc.jyu.fi/~pmakkone/tjta111/

Biggs, John 2003. Teaching for Quality Learning at University. 2nd ed., The Society for Research into Higher Education & Open University Press.

Pessoa de contacto (nome, correio electrónico, telefone)

Pekka Makkonen, professor
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Universidade de Jyvaskyla FINLÂNDIA

Teorias da Aprendizagem (Noruega)

Nome do caso:
Learning theories

Universidade, departamento e país:
Stord/Haugesund University College, Departmento de Educação de Professores, Noruega

Contexto de estudo (nível de estudos, assunto):
10 créditos do mestrado "*ICT in learning*" (As TIC no Ensino)

Público-alvo:
Professores, alunos de educação, desenvolvidores e orientadores de *e-learning*

Descrição:
Neste módulo os alunos aprendem as teorias e os métodos relacionados com o uso das ferramentas digitais na aprendizagem. O objectivo principal é o uso e a integração das TIC na educação.

Conteúdos:
- Instruções principais em relação ao curso
- Memória
- Metacognição
- Transferência de aprendizagem/conhecimento
- Aprendizagem social

As diferentes teorias devem relacionar-se com situações e experiências práticas.

Abordagem pedagógica:
Os cursos no programa de estudo usam:
- Ensino presencial e apoio de orientador
- Apoio electrónico
- Transmissão de vídeo

Abordagens pedagógicas:
- Aprendizagem colaborativa e construtivista
- Aprendizagem com base em problemas
- Aprendizagem com base em projectos

Todas as teorias se relacionam e adaptam ao ensino e apoio de alunos em modo presencial e em modo remoto.

Uso de tecnologias:
O curso está organizado tanto para alunos que estejam no *campus* ou fora dele. Para providenciar um programa de estudo adequado a estes grupos, o estudo usa a Internet e *Learning Management Systems* (sistemas de gestão da aprendizagem) em grande parte. As tarefas que são realizadas com essas ferramentas são:

- Distribuição de materiais
- Transmissão de vídeos em directo ou a pedido
- Interacção professor-aluno e aluno-aluno
- Comunicação síncrone
- Comunicação assíncrone
- Apoio
- Cooperação e colaboração

Método de combinação:
As aulas em sala são uma parte relativamente pequena do curso, sendo transmitido em directo ou em vídeos a pedido. O apoio é dado de acordo com a localização dos alunos: aqueles que estiverem no *campus* têm apoio presencial, os que estiverem fora do *campus* têm apoio remoto através do correio electrónico, de *learning management systems*, de comunicação síncrone, por exemplo através do MSN, e comunicação assíncrone, através dos fóruns de discussão. Na prática está demonstrado que os alunos que estão no *campus* também usam em grande parte as mesmas ferramentas que aqueles que estão fora do *campus*. A comunicação entre os alunos num grupo composto por esses dois tipos baseia-se muito em ferramentas de comunicação síncrone e assíncrone.

Conclusões e resultados da avaliação:
40 alunos de mestrado concluíram o curso, sendo a taxa de desistências muito baixa.
Os alunos deram de uma forma geral uma opinião positiva aos professores.

Informação adicional e referências:
http://stud.hsh.no/lu/inf/master/ (em Norueguês)
http://www.hsh.no/english/ICT_in_Learning.pdf (em Inglês)

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Ambiente Global e Estudos de Desenvolvimento – Gestão do Desenvolvimento (Noruega)

Nome do caso:
Global Environment and Development Studies – Development Management

Universidade, departamento e país:
Agder University College, Faculdade de Economia e de Ciências Sociais, Instituto de Estudos do Desenvolvimento, Noruega

Contexto de estudo (nível de estudos, assunto):
Mestrado em Ciências, Estudos Ambientais, assunto: questões sobre o ambiente global.

Público-alvo:
Alunos africanos e noruegueses com grau de bacharel relevante, conhecimentos académicos de Inglês, interesse pelo desenvolvimento sustentável.

Descrição:
O objectivo deste estudo é familiarizar os alunos com as teorias e descobertas sobre o desenvolvimento, mas também disponibilizar ferramentas de gestão para problemas práticos. As soluções para os problemas são procuradas numa variedade de disciplinas, incluindo a economia e as áreas funcionais da gestão, ciências políticas, sociologia, antropologia e geografia. É tomada em consideração uma ampla variedade de contextos institucionais, incluindo negócios privados locais e internacionais, organizações não-governamentais, governos centrais e locais, instituições reguladoras internacionais e nacionais e instituições doadoras.
Os alunos encontram-se pessoalmente uma ou duas vezes durante o período de dois anos do programa de estudo.

Abordagem pedagógica:
Abordagem sobretudo de social construtivismo

Uso de tecnologias:
Internet, *Management Learning System*, vídeo, CD-ROM

Método combinado:
Durante o programa de estudo de dois anos a tempo inteiro os alunos, professores e orientadores encontram-se duas vezes, durante um período de seis semanas. Nas duas primeiras semanas encontram-se para se conhecerem, para praticarem o uso do LMS e para assistirem à introdução sobre a pedagogia de social construtivismo usada nas salas de aula virtuais.
No segundo período de duas semanas os alunos, professores e orientadores encontram-se na África do Sul. Nas duas primeiras semanas praticam o uso do GIS. O resto do tempo é usado para formação em campo em técnicas de entrevista e métodos de pesquisa.
O resto dos dois anos é de estudo *online* colaborativo. Neste programa é usado o sistema designado de “quality assured study sites” (locais de estudo de qualidade comprovada). Isso significa que cada 3-4 alunos de cada país têm disponíveis as suas próprias salas de computadores com computadores e infraestruturas no campus onde residem durante esse tempo. Deste modo os alunos têm oportunidade de discutir os trabalhos informalmente antes de acederem às salas de aula virtuais na Internet.

Conclusões e resultados da avaliação:
Após conclusão do curso os participantes devem conseguir:
• Apresentar diferentes pontos de vista quanto ao conceito de desenvolvimento e às questões actuais sobre o desenvolvimento
• Discutir a relação entre o governo, a ajuda e a globalização
• Descrever e discutir de forma crítica os problemas que se relacionam com o crescimento urbano, o desenvolvimento das pequenas cidades e o impacto nas zonas rurais.
• Dar uma panorâmica sobre as tendências da população mundial e discutir se existe um problema populacional
• Discutir se o conceito de desenvolvimento sustentável tem mais relevância para a situação em países pobres ou ricos

Os participantes beneficiarão de/melhorarão as suas capacidades de:
• Trabalho colaborativo *online* e presencial com colegas através da partilha de ideias; análise de problemas; negociação de ideias e descoberta de soluções;

Resultados dos exames no primeiro ano: acima da média.

Informação adicional e referências:
http://www.hia.no/oksam/english/mdevm/index.php3
http://www.gvu.unu.edu/prog.cfm

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As TIC no Ensino (Noruega)

Nome do caso:
ICT in Learning (programa de mestrado, 120 cr)

Universidade, departamento e país:
Stord/Haugesund University College, Departmento de Educação de Professores, Noruega

Contexto de estudo (nível de estudos, assunto):
Curso de mestrado, integração e aplicação das TIC no ensino

Público-alvo:
Alunos de ensino, professores e desenvolvidores de ambientes com base nas TIC

Descrição:
O principal objectivo deste curso é o uso e a integração das TIC na educação. Não se trata de um curso sobre tecnologia e sobre teorias da aprendizagem como disciplinas separadas. O estudo baseia-se em ideias de estudos similares para as TIC e a aprendizagem noutros países. Tem as suas raízes na formação de professores e constitui o quarto e quinto anos de um curso de cinco anos que confere certificado de abilitação para ensino e grau de mestre em TIC no ensino.

Abordagem pedagógica:
Os cursos no programa de estudos usam:

- Ensino e apoio local
- Apoio através da Internet
- Seminários obrigatórios nos quais todos os alunos se encontram presenvialmente na universidade (poderão ser seminários virtuais (vídeo))

Os diferentes cursos neste estudo baseiam-se em abordagens pedagógicas relevantes para o conteúdo do curso. As teorias e modelos aplicados são:

- Aprendizagem colaborativa e construtivista
- Aprendizagem com base em problemas
- Aprendizagem com base em projectos

Todas as teorias se relacionam e estão adaptadas ao ensino e apoio tanto a alunos no *campus* como alunos fora do *campus*.

Uso de tecnologias:
O curso está organizado tanto para alunos do *campus*, como para alunos que se encontrem fora do *campus*. Para proporcionar aos grupos um programa de estudos adequado este estudo usa a Internet e um *Learning Management System* em grande parte. As tarefas que são realizadas com estas ferramentas são:

- Distribuição de material
- Transmissão de vídeos em directo e a pedido
- Interacção professor-aluno

- Comunicação síncrone
- Comunicação assíncrone
- Apoio
- Cooperação e colaboração

Método de combinação:
O ensino em auditório ou sala de aula é uma parte relativamente pequena do curso. Isto é válido para alguns dos cursos transmitidos em directo e a pedido.
O apoio é dado conforme a localização dos alunos. Aqueles que estão no campus recebem apoio presencial – bem como através da Internet – e os que estão fora do campus recebem apoio através do correio electrónico, *learning management systems*, comunicação síncrone como por exemplo através do MSN e comunicação assíncrone através dos fóruns de discussão. Na prática verifica-se que os alunos no *campus* usam em grande parte as mesmas ferramentas que os alunos que estão fora do *campus*.
A comunicação entre os alunos - em grupos mistos de alunos no *campus* e fora dele – é também muito baseada nas ferramentas de comunicação síncrone e assíncrone.

Conclusões e resultados da avaliação:
20 alunos concluíram até agora o curso com bons resultados.
Os resultados dos questionários de avaliação *online* realizados aos alunos no final dos cursos individuais são de uma forma geral positivos, mas é necessária a revisão de conteúdos, de métodos e de tecnologia. Será publicada uma versão revista do programa-base em Agosto de 2007.

Informação adicional e referências:
http://stud.hsh.no/lu/inf/master/ (em Norueguês)
http://www.hsh.no/english/ICT_in_Learning.pdf (em Inglês)

Pessoa de contacto (nome, correio electrónico, telefone)
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Publicar na Internet (Noruega)

Nome do caso:
Internet Publishing

Universidade, departamento e país:
Sør-Trøndelagi Ülikooli Kolledž, Departmento de Informática e de *e-Learning*, Noruega; Professor: Svend Andreas Horgen

Contexto de estudo (nível de estudos, assunto):
Estudos preliminares sobre a tecnologia da Internet, um curso sobre HTML e JavaScript e abordagem sobre as tecnologias da Internet em geral.

Público-alvo:
Alunos do primeiro ano de Informática/Economia

Descrição:
Tenho usado as técnicas do *e-learning* para aumentar a actividade dos alunos nas aulas. Em vez de dar aulas num auditório, tenho usado uma sala de computadores. Isso tem-me permitido alternar entre exercícios teóricos e práticos. Tenho usado também um sistema de LMS para melhorar a experiência de *blended learning*. Eis uma lista das actividades/índices usados:

- Formulários de avaliação com questões para serem preenchidas pelos alunos antes de a teoria ser ensinada. Benefício: os alunos entram em modo de aprendizagem e irão provavelmente aprender mais e ser mais activos durante a sessão teórica que se segue
- Abordagem teórica de 15-20 minutos
- Questões de escolha múltipla ou alguns exercícios práticos, usando também o LMS.
- Outra sessão teórica de 15-20 minutos
- Um intervalo de 20 minutos.
- Em primeiro lugar, uma outra avaliação com questões de resposta aberta sobre alguns assuntos que foram ensinados alguns minutos antes. Isto dá-me informação útil enquanto docente (enquanto os alunos fazem o intervalo) para perceber quais são as suas ideias erradas ou lacunas no seu conhecimento
- E assim em diante...

Tentei também uma outra coisa interessante: Per Borgesen (um meu colega) e eu próprio demos uma aula em conjunto – na qual ambos falámos sobre coisas diferentes (alternadamente) e nos interrompemos e comentámos um ao outro. Desta forma a aula não foi tão "monocórdica" e foi mais fácil manter um diálogo com os alunos. A desvantagem é que precisámos, claro, de estar ambos presentes.
Apesar de termos gasto o dobro do tempo em comparação com uma aula com um único professor, os alunos ficaram muito mais motivados quando dávamos a aula em conjunto. É de mencionar que fizemos este exercício apenas na primeira e última aula de cada semestre (neste curso), por isso não é demasiado desgastante!

Tentei também usar podcasts (ficheiros áudio) – ou seja: descarregar podcasts de notícias sobre TI ou outros assuntos relevantes e depois, tipicamente:

- pôr os alunos a ouvi-lo durante 5-10 minutos

- discuti-lo em pequenos grupos durante 5-10 minutos – qual era o assunto e como é que isso se relaciona com a teoria.
- Conclusão elaborada por mim/pelos alunos em plenário durante 5-10 minutos.

Abordagem pedagógica:
Descrita em detalhe no item anterior.

Uso de tecnologias:
Sistema LMS, um computador para cada aluno, auriculares (para ouvir os podcasts)

Método de combinação:
Descrito em detalhe mais acima.

Conclusões e resultados da avaliação:
A avaliação informal indica que os alunos são receptivos a esta forma de ensino. Também é bom porque aqueles que não puderem estar presentes na aula podem ter acesso aos materiais através do LMS. Apenas faltam à lição e à minha "exposição" verbal

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Em Norueguês: http://www.aitel.hist.no/~svendah/FoU/PPT/horgen-blended-learning-steinkjer-oktober-2006.ppt

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Programação Matemática (Lituânia)

Nome do caso:
Mathematical Programming

Universidade, departamento e país:
Vytautas Magnus University, Departmento de Informática Aplicada, Kaunas, Lituânia

Contexto de estudo (nível de estudos, assunto):
Programa de estudos de licenciatura (quarto ano de estudos). *Mathematical Programming*

Público-alvo:
Os alunos dos departamentos de Informática, Economia, Engenharia e Matemática Aplicada são os principais destinatários deste curso.

Descrição:
Este curso combina as esferas teórica e prática, mas está mais orientado para a resolução prática de tarefas para determinado fim, de modo a que o alunos possa aprender a formular tarefas práticas de optimização que são baseadas na terminologia matemática, seja capaz de determinar a adequabilidade e complexidade do modelo escolhido, seja capaz de escolher um algoritmo apropriado para a solução de uma tarefa prática formulada matematicamnte, seja capaz de entender os resultados de optimização e possa aconselhar outros sobre questões ligadas à optimização de métodos e de *software*.

O curso lida com a classificação de problemas e métodos de solução (método do gradiente, conjugação do método de gradiente. Método de Newton e suas modificações. Métodos de pesquisa), conjuntos e funções convexas, optimização global. Condições mínimas para problemas com constrangimentos. Penalizações e métodos de barreira para problemas com restrições. Programação linear. Soluções simples. Algoritmo simples. Métodos de complexidade polinomial para programação linear. Optimização multi-critério. Ao criar o curso foi dada muita atenção à experiência acumulada na análise da ciência na esfera de optimização o ensino de disciplinas similares foi também usado como um exemplo.

Abordagem pedagógica:
O curso foi preparado sob forte influência da metodologia de *Project Based Learning* (PBL). Ao criar o curso foram analisados e discutidos com os colegas muitos outros cursos similares de diferentes universidades. Os cursos necessários em sistemas de produção e simulação baseiam-se nestas aptidões e providenciam experiências de design em engenharia.

O ensino tradicional é combinado com o ensino baseado na resolução de problemas, em projectos e em discussão. Os alunos estudam a parte teórica de forma autónoma e por vezes assistem a aulas, podem também assistir a lições *online* (onde encontram ficheiros das lições). Durante as discussões têm que discutir o assunto sugerido pelo professor na lição ou que é importado para a página na Internet.

Todos os trabalhos são obrigatórios e os prazos dos projectos (que estão na agenda electrónica) e dos trabalhos estão na mesma página da Internet. Aí podem ainda encontrar o calendário das aulas e os horários de atendimento do assistente ou do professor.

Uso de tecnologias:

1. As instruções sobre o trabalho prático estão na página principal do curso, onde se encontram também alguns materiais ilustrativos e exemplos de soluções de problemas preparados por alunos, bem como conteudos teóricos mais avançados (por exemplo aulas do Professor J.Clausen) e referências de software.
2. Está também disponível um dicionário electrónico com ligações para mais informação.
3. Fóruns de discussão
4. E-mail para contactar com o professor
5. Vídeoconferência para as aulas online
6. Virtual learning environment (Sistema de ensino virtual - FirstClass)

Método de combinação:

Blended learning: combinação híbrida – aulas tradicionais (presenciais) (15 aulas, cada uma de duas horas) e seminários com colaboração à distância com os alunos (fóruns de discussão, questionários *online*, reuniões em vídeoconferência; os alunos encontram todo o material no ambiente virtual, para onde descarregam os seus projectos, os resultados de laboratório e outros trabalhos de casa usando as suas palavras-chave) (são dadas 52 horas para um trabalho individual e os alunos têm 15 lições na aula de laboratório, que duram duas horas cada uma) e usam as tecnologias para comunicar e trocar informação, testes e trabalhos. .

Conclusões e resultados da avaliação:

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Informação adicional e referências:

Livros electrónicos sugeridos:

1. Antanas Žilinskas, Matematinis programavimas (em formato pdf e html, em Lituano);
2. Benny Yakir, Nonlinear optimization (em formato pdf);
3. Jonas Mockus, Global and discrete optimization (em formato html);
4. Article: "Jens Clausen Teaching Duality in Linear Programming - the Multiplier Approach' (em formato pdf).

Página na Internet para extracção e colocação de informação para estudos:
http://fcim.vdu.lt/Conferences/F00017C98/F00052D02/?WasRead=1
Dicionário com os conceitos principais com ligações para manuais mais abrangentes:
http://mathworld.wolfram.com/

Material adicional para o curso:

1. Žilinskas A. Matematinis programavimas. VDU, 1999.
2. Bazaraa M., Sherali H., Sheti C., Nonlinear programming. J.Wiley, 1993.
3. Bertsekas D. Nolinear Programming. Athea Scienfic,1995.

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Especificação de Requisitos (Lituânia)

Nome do caso:
Requirements specification

Universidade, departamento e país:
Kaunas University of Technology, Departmento de Engenharia de *Software*, Kaunas, Lituânia

Contexto de estudo (nível de estudos, assunto):
Área de estudo das Ciências Tecnológicas.
O módulo de estudo 'Requirements specification' é destinado a alunos de mestrado que estudam Engenharia de Sistemas de *Software* e é um de quatro módulos de investigação. Os outros módulos do programa são 'Analysis of *Software* Systems architecture' (Análise da Arquitectura de Sistemas de *Software*), 'Information technologies in project management' (Tecnologias de Informação em Gestão de Projectos), '*Software* implementation investigation' (Investigação sobre Implementação de *Software*).

Público-alvo:
Alunos de mestrado da Faculdade de Informática.

Descrição:
A atenção principal é dada à análise e especificação de requisitos (módulos '*Software* Requirements Analysis' (Análise dos Requisitos do *Software*) e 'Simulation and Validation of Systems' (Simulação e Validação de Sistemas)). Desse modo os alunos de mestrado já estudam métodos e ferramentas de análise de requisitos no início do programa de estudos e mais tarde podem usar os conhecimentos adquiridos para formar a especificação de requisitos da área objectiva para informatização, de acordo com a tese de mestrado. Em simultâneo com os cursos anteriormente descritos são disponibilizados dois cursos genéricos sobre a área da Engenharia de *Software*: '*Software* Engineering Process' (Processo de Engenharia de *Software*) e '*Software* Engineering Management' (Gestão de Engenharia de *Software*). Estes cursos têm em vista expandir e aprofundar o conhecimento adquirido nos estudos de bacharelato. Durante o desenvolvimento do projecto os alunos familiarizam-se com as normas, preparam propostas, plano e especificações dos requisitos do projecto.
Os assuntos principais são: documentação dos requisitos do *software*; evolução dos requisitos; análise de problemas; descrição do modelo de sistema; modelação de dados; requisitos funcionais e não-funcionais; uso de protótipos para a especificação de requisitos; desenvolvimento do documento de requisitos do *software*.

Abordagem pedagógica:
Uma combinação de conhecimento teórico e de competências práticas de modo a que os alunos possam criar e produzir sistemas de *software* de modo eficaz que cumpram os requisitos dos utilizadores e dos clientes, aprendam a avaliar, analisar e simular factores de qualidade do *software*, para assegurar o desenvolvimento disciplinado e controlável de um sistema de *software*. O *e-learning* é muito usado durante o curso. A informação de gestão do curso é pública e está disponível na Internet.
A ideia principal do sistema deste curso é a integridade da ciência e estudos e a formação em aptidões criativas, com base no trabalho autónomo e sistemático dos alunos. Dá-se especial relevância à criação prática. Noutras palavras o princípio basilar é o ensino através da criação. Assim sendo, do ponto de vista pedagógico é um curso com um ensino baseado em projectos e na resolução de problemas.

Uso de tecnologias:

1. Página do curso (http://soften.ktu.lt/~virga/mag_atmintine). Temas para projecto, formulários para documentos, exemplos, normas, requisitos para apresentações, horários, competências exigidas, requisitos de qualidade do projecto e do *software* – que são importados para esta página - bem como todos os prazos para os trabalhos e material necessário para o curso e para preparação para os testes.
2. Sistemas de informação criados por cada aluno individualmente no início de cada curso, nos quais é obrigatório que estejam todos os documentos necessários e testes que o aluno faz. Estes sistemas de informação são provados, podem ser acedidos apenas através de palavras-chave tal como é exigido pela maior parte dos clientes deste tipo de projectos.
3. A comunicação com o professor é feita através do correio electrónico e dos seminários.
4. Os problemas do curso de mestrado são discutidos no fórum *online* http://proin.ktu.lt

Método de combinação:

Aulas tradicionais e seminários com colaboração à distância com os alunos, uso de tecnologias para comunicação e troca de informação, trabalhos e testes.

Conclusões e resultados da avaliação:

Os objectivos da avaliação são: reconhecer aquelas estratégias e técnicas que se provou serem eficazes durante o projecto, de modo que o seu uso possa ser reforçado ou expandido; e identificar áreas no processo e no produto que precisem de ser melhoradas no próximo projecto.

O benefício de avaliar um projecto de *software* é a melhor compreensão da organização do projecto e do desenvolvimento do projecto, bem como das pessoas que estão envolvidas, o que é essencial para a capacidade de realizar melhorias aos processos de *software*.

Após completarem quatro módulos:

- A nota média para a qualidade do projecto dada pelos orientadores do projecto de mestrado é de 9.72;
- Os alunos de mestrado avaliaram os seus projectos numa média de 8.33;
- A nota média para o apoio dos orientadores dos projectos de mestrado indicada pelos alunos é de 8.28;
- A nota média para a organização do processo de criação do projecto de mestrado indicada pelos alunos é de 7.71;
- 43% dos alunos referiram que o número de apresentações do projecto de mestrado foi demasiado grande, 57% suficiente e nenhum aluno indicou que o número era demasiado pequeno.
- A nota média para o trabalho dos alunos de mestrado nas empresas indicada pelos orientadores da parte prática é muito elevada – 9.93;
- Apenas 76% dos alunos consideraram a prática como útil para o desenvolvimento das suas aptidões;
- O local de prática correspondeu ao assunto do projecto de mestrado para 62% dos alunos.

Informação adicional e referências:

Material metódico para “Project Management’: http://proin.ktu.lt/~kestas/Proj_vald/Kepure.html (em Lituano)
Software Engineering Standards:: http://soften.ktu.lt/~virga/mag_atmintine/1sem/standartai.htm
Outra literatura:: http://soften.ktu.lt/~virga/mag_atmintine/interneteka.html
Existem também muitos exemplos e conselhor sobre como fazer trabalhos práticos.

Outra literatura em Inglês:
1. I.Sommerville. Software Engineering. Addison-Wesley, 4ª,5ª, 6ª edições
2. R.S. Presman and D.Ince. Software Engineering - A Practitioner's Approach. McGraw-Hill, 3ª, 4ª,5ª edições
3. G.Booch. Object-Oriented Analysis and Design. The Benjamin/ Cummings Publishing Company, Inc., 1994
4. R Pooley and P Stevens. Using UML: Software Engineering with Objects and Components. Addison-Wesley, 1999
5. M.Cotterell, B.Hughes. Software Project Management. International Thompson Computer Press, 1995
6. G.Booch, J.Rumbaugh, I.Jacobson. Unified modeling language user guide. Addison-Wesley, 1998
7. I.Jacobson, G.Booch, J. Rumbaugh. The Unified Software Development Process. Addison-Wesley, 2000
8. J.Martin and J. Odell. Object-Oriented Methods: a Foundation. Second UML Edition. Prentice-Hall, 1998
9. C.Larman. Applying UML and Patterns. Prentice-Hall, 2000
etc.

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Química Orgânica (Estónia)

Nome do caso:
Organic chemistry

Universidade, departamento e país:
Universidade de Tallinn, Departmento de Ciências Naturais, Estónia

Contexto de estudo (nível de estudos, assunto):
Curso de introdução à química orgânica, nível de bacharelato

Público-alvo:
Alunos do segundo ano que se estejam a especializar em Biologia e para os quais a Química seja uma área menor de especialização.

Descrição:
O objectivo deste curso é fazer uma introdução aos princípios básicos da Química Orgânica e dar uma ideia geral dos compostos orgânicos mais importantes. A secção prática faz uma introdução às técnicas principais usadas na análise, purificação e síntese de compostos orgânicos. O conhecimento de química orgânica é necessário para estudos de química biorgânica, bioquímica e química ambiental.

Abordagem pedagógica:
Devido ao elevado nível de abstracção do assunto é difícil implementar métodos de ensino activo (tais como discussões, desempenho de papéis e colaboração *online*) neste curso. É por esse motivo que este curso se baseia em trabalhos individuais.
O fórum IVA é usado para discussões sobre as experiências práticas, como ambiente de e-learning. Os alunos têm a oportunidade de comparar os seus resultados e discutir por que motivo algumas experiências foram mal sucedidas e outras não.
Os alunos têm que escrever um trabalho que é depois revisto pelos colegas. Cada revisão tem que ter uma abordagem diferente.

Uso de tecnologias:
A maior parte das funcionalidades do IVA LMS são usadas no curso: *blog*, fórum de discussão, portfólios individuais e de grupo, inquéritos, *wikis*.
Os computadores são também necessários para fazer as apresentações e para pesquisar literatura.
De modo a concluir o curso com sucesso os alunos tiveram que usar o *software* de modelação molecular gratuito MDL Isis Draw que foi possível descarregar da plataforma de *e-learning* IVA.
Os ficheiros de texto e vídeo e o software para instalação estão disponíveis em CD-Rom para cada aluno que não tenha acesso rápido à Internet.
Os alunos tiveram a possibilidade de obter o apoio técnico de um instrutor e o manual do utilizador do IVA também foi útil.

Método de combinação:
O curso de química orgânica é baseado em parte na Internet, uma parte significativa das actividades de aprendizagem decorre no IVA Learning Management System. É adequado para alunos que estejam na universidade, mas também para pessoas cujo trabalho esteja ligado a este assunto e para o qual precisem de conhecimentos adicionais. A participação no curso exige o conhecimento de muitos factos e também é importante ter raciocínio abstracto e uma boa memória.

O curso é híbrido, há aulas de uma hora e meia (introdutórias, os materiais estavam no *learning management environment* IVA), seminários de três horas (apresentações e revisões de outros alunos) e práticas de 34 horas (em química não é possível fazer a prática em formatos Internet).
Os recursos de aprendizagem são essencialmente em formato .pdf ou em formato de apresentação. Foram usadas muitas ilustrações coloridas, esquemas, diagramas – o que dificulta a impressão aos alunos, pelo que cada um recebe um CD-Rom com materiais de vídeo.

Conclusões e resultados da avaliação:
O curso realizou-se duas vezes até agora e em ambas as edições foi bastante bem sucedido. No ano passado houve 26 alunos inscritos, dos quais 24 passaram. Para receberem as notas os alunos têm que fazer dois curtos testes na Internet (10%), um pequeno trabalho escrito (10%) e têm que preparar uma apresentação (10%). Para além disso os alunos têm que defender os seus relatórios de laboratório (15%) e fazer um teste escrito sobre esses relatórios de laboratório (15%) e por fim têm qie fazer um teste presencial escrito (40%). A aprendizagem activa na plataforma IVA pode ter uma boa influência nas notas dos alunos.

Informação adicional e referências:
http://iva.tlu.ee/IVA
user: DEMO
password: DEMO

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Música Étnica (Estónia)

Nome do caso:
Ethnomusic

Universidade, departamento e país:
Universidade de Tallinn, Departmento de Artes, Departamento de Música, Estónia

Contexto de estudo (nível de estudos, assunto):
Curso de mestrado em Educação Musical

Público-alvo:
Alunos do curso MA "Musical education" (grupos mistos para alunos no *campus* e à distância). O curso pode ser frequentado (e é na realidade frequentado com regularidade) por alunos de outras faculdades como um curso facultativo.

Descrição
Este curso aborda a cultura da música dos quase-vizinhos (da Letónia, Lituânia, Ucrânia, Finlândia, Suécia, Noruega, Ásia e América), em especial da música e cultura *folk*, com foco não só na música mas também no texto, imagens e vídeos. A rica colecção de recursos digitais *online* é útil para alunos, porque estão sempre acessíveis e podem ser reutilizados pelos alunos durante a sua prática profissional. O curso serve de exemplo para professores de música, ao demonstrar como os assuntos de música étnica podem ser ensinados de formas mais interactivas e reflexivas nas escolas primárias.
O objectivo é que os alunos sejam capazes de analisar os aspectos didácticos do ensino de tradições de música *folk* e depois usá-los no trabalho com crianças. Os alunos conhecerão também as características do folclore dos seus vizinhos e podem identificar as peculiariedades da música *folk* de diferentes nações através da análise de acções musicais. Os alunos podem usar o computador como uma ferramenta de aprendizagem, comunicação, criação e apresentação.

Abordagem pedagógica:
A abordagem comparativa aos estudos culturais é combinada com a pedagogia social-construtivista.

Uso de tecnologias:
É usada a maior parte das funcionalidades do *virtual learning environment* IVA (com excepção dos wikis) no curso: fóruns, *blogs*, acesso a materiais de aprendizagem digital, submissão e classificação de trabalhos. Os computadores são também necessários para fazer as apresentações e pesquisar literatura.

Método de combinação:
Através de tarefas individuais os alunos têm que trabalhar com base na literatura e nos materiais das aulas. Também têm que preparar uma apresentação sobre uma música de uma nação (no ambiente IVA ou em formato .ppt / registo de discurso / portfólio) e resolver algumas tarefas com base na Internet (palavras cruzadas e preenchimento de lacunas em textos) e participar em discussões. O curso termina com dois testes (por exemplo sobre música da Letónia e da Lituânia). 75% do curso é baseado na Internet, sendo o trabalho realizado no ambiente IVA.

Conclusões e resultados da avaliação:
Dos 12 alunos que iniciaram o curso no ano passado, todos o concluíram.
Para terem nota os alunos têm que estar presentes em pelo menos 50% das aulas teóricas, as lições práticas têm que ser realizadas mais tarde sob orientação, têm que fazer estudo individual e também é importante que participem nas discussões.

Informação adicional e referências:
Este curso foi seleccionado como "e-course do ano 2004" por usar multimédia (http://www.e-uni.ee/index.php?main=148)
Os recursos de aprendizagem estão no ambiente IVA (http://iva.htk.tpu.ee)

Pessoa de contacto (nome, correio electrónico, telefone)
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Tecnologia Educacional (Estónia)

Nome do caso:
Educational Technology

Universidade, departamento e país:
Universidade de Tallinn, Departmento de Ciências Educacionais, Estónia

Contexto de estudo (nível de estudos, assunto):
Trata-se de um curso de introdução à tecnologia educacional para alunos de mestrado.

Público-alvo:
O grupo é composto por pelo menos 10 alunos, a maior parte deles de cursos de Ciências Educacionais e do Mestrado em Gestão Educacional.
Este curso tem pré-requisitos: os alunos têm que fazer o curso introdutório à literatura computacional.

Descrição:
O curso pertence ao domínio da didáctica, com foco nos objectivos e métodos de tecnologias de informação no processo educacional.
O objectivo do curso é desenvolver competências no desenvolvimento de materiais de aprendizagem digital e publicá-los na Internet, aprendizagem e ensino em ambiente Internet, desenvolvimento de apresentações multimédia e de páginas na Internet, etc.
Este curso abrange os seguintes tópicos teóricos: conceitos básicos em tecnologia educacional, computadores em escolas estónias – história e situação actual, as TIC na política educacional, didáctica de uso das TIC na aprendizagem, abordagem da investigação sobre tecnologia educacional realizada na Estónia, TIC e normas de competências no uso dos *media* no currículo nacional, métodos para uso de computadores e a Internet em assuntos, projectos integrados de aprendizagem com base nas TIC.

Abordagem pedagógica:
O curso é baseado na abordagem construtivista, os alunos aprendem a criar (conhecimento) artefactos por si próprios (tanto em tarefas individuais como de grupo), mas também reflectindo sobre a sua experiência e revendo o trabalho dos seus colegas.

Uso de tecnologias:
Todas as actividades presenciais são realizadas em sala de computadores, onde cada aluno tem acesso a um computador. Só é usado software open source para os trabalhos: OpenOffice, Audacity, Wink, Mozilla Composer. O *Learning Management System IVA* é usado activamente, a maior parte das discussões e reflexões são realizadas com a ajuda de ferramentas de blog e wiki no ambiente IVA.

Método de combinação:
O curso concede 3 créditos e tem 32 horas de actividades presenciais em vez das habituais 48 num curso normal. Combinar o *e-learning* com formas e métodos tradicionais feito de duas formas neste curso: a maior parte das actividades presenciais são realizadas numa sala de computadores sob a forma de *e-learning* frontal e síncrone e uma outra parte importante das actividades de aprendizagem são realizadas no ambiente de aprendizagem virtual IVA.

Conclusões e resultados da avaliação:
Apenas um aluno em 15 não concluiu o curso no ano passado. Para obter nota era preciso fazer um trabalho escrito (15% da nota), completar o inquérito final (15%), preparar uma estratégia de TIC para a própria escola (30%), planear um projecto integrado de *e-learning*, desenvolver um conjunto de recursos de aprendizagem digitais, fazer uma apresentação de um portfólio pessoal electrónico (20%). Os alunos que não preparassem e apresentassem os seus portfólios electrónicos não teriam uma nota superior a D. O desenvolvimento de portfólios era importante porque não era feito apenas para um curso, os alunos deviam continuar a desenvolvê-lo durante a sua prática escolar e desse modo o facilitador poderia ter a oportunidade de ver aquilo que os alunos fazem, o que é que aprendem, quando o curso termina.

Informação adicional e referências:
http://iva.tlu.ee/IVA
user DEMO
password DEMO

Pessoa de contacto (nome, correio electrónico, telefone)
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Planeamento e Gestão de Projectos (Estónia)

Nome do caso:
Project planning and management

Universidade, departamento e país:
Universidade de Tallinn, Departmento de Ciências Sociais, Estónia

Contexto de estudo (nível de estudos, assunto):
Este curso foi criado para estudos do Mestrado em administração pública, mas tem sido muito popular também entre os alunos de outras faculdades, em virtude de a gestão de projectos se ter tornado uma das mais populares pequenas áreas na universidade.

Público-alvo:
Este curso é destinado sobretudo a alunos de mestrado, mas os alunos de bacharelato podem normalmente frequentá-lo também. O segundo (e algo grande) público-alvo consiste em clientes da Open University (Universidade Aberta), que podem frequentar este curso apenas para fins de desenvolvimento profissional. O curso pode ser (e tem sido) realizado também por algumas empresas sob a forma de formação interna para os seus colaboradores.
O grupo é grande, o último grupo era constituído por 50 alunos à distância e 75 alunos do *campus*. No curso-piloto houve 15 alunos.

Descrição:
Este curso providencia uma visão dos tópicos específicos do trabalho de projecto; os participantes ganham experiência prática em planeamento e gestão de projectos ao implementarem os métodos de trabalhos de projecto e de concepção de um plano de projecto. O objectivo do curso é desenvolver as aptidões dos alunos para que eles consigam de uma forma independente preparar, planear e implementar projectos, melhorando dessa forma a sua competitividade no mercado de trabalho.
Tópicos abordados: o conceito de projecto, tipos e história. A estrutura da organização de projecto. As fases, *inputs* e *outputs* de um projecto. Fase de identificação: análise de problemas, desenvolvimento de ideias. Estudo preliminar: pesquisas de mercado, análises de risco, matriz SWOT.
Formulação de objectivos do projecto. Proposta do projecto, concorrência. Fase de planeamento e de concepção do plano: desenvolvimento do calendário de actividades, o orçamento, planeamento de recursos humanos e sistema de gestão da qualidade. Planeamento da comunicação, sistemas de informação e de coordenação, estratégia de liderança e tácticas de gestão. Fase de implementação. Fase de avaliação: análise, avaliação, compilação do relatório final. *Software* de gestão de projectos.
A gestão do tempo é o foco principal do curso. Os alunos têm que criar diagramas GANTT e Pert usando o MS Project.

Abordagem pedagógica:
Este curso é muito baseado na aprendizagem colaborativa. O LMS IVA permite avaliar os trabalhos de grupo e as contribuições individuais. As tarefas de grupo não são importantes apenas para propósitos de construção do conhecimento colaborativo, mas devido à natureza do trabalho de projecto em geral – os projectos são quase sempre colaborativos e é por isso que a experiência prática de trabalho colaborativo é importante. As opiniões recebidas indicam que este curso ofereceu aos alunos a única possibilidade de realizarem trabalho colaborativo durante os seus estudos porque a maior parte dos cursos de (*e-learning*) se baseiam em trabalho individual.
Os grupos são compostos por 4-6 alunos e usam portfólios de grupo no IVA LMS. Eles possuem uma pasta partilhada para

apresentarem os seus trabalhos ao professor para avaliação. Os alunos usam *wikis*, registos textuais e a submissão de ficheiros no IVA.
A comunicação informal em grupo, que os outros não podem ver, acontece através de correio electrónico ou de conversações no MSN ou no fórum do IVA. Infelizmente não há sala de *chat* no IVA.

Uso de tecnologias:
A maior parte das actividades presenciais são realizadas na sala de computadores. Os alunos devem usar computador em casa para poderem contribuir na colaboração online do seu grupo de trabalho usando o IVA LMS.
Existe uma cópia de avaliação do *software* de gestão de projectos para instalação no IVA LMS, os alunos devem usá-lo nos seus trabalhos.
O repositório *online* de recursos digitais de aprendizagem contém sobretudo diagramas e exemplos criados no software MS Project.
O tutorial interactivo do *software* MS Project também está disponível.

Método de combinação:
Existem cinco dias de contacto num semestre, é obrigatório que cada aluno participe pelo menos em três dias de contacto. Cada aluno tem que ler um manual *online* sobre gestão de projectos e também um livro escolhido por si próprio.

Conclusões e resultados da avaliação:
Todos os trabalhos colaborativos e individuais são apresentados publicamente, para que os alunos possam aprender uns a partir dos outros (método de *benchmarking*). Os alunos têm que avaliar o trabalho dos outros grupos uma a duas vezes usando as folhas de avaliação da Comissão Europeia, o que lhes confere experiência de avaliação e é bom para a redacção da proposta de projecto.
Como o curso tem valor prático, não há testes. Do mesmo modo, no IVA a participação no fórum não é avaliada. 70% da nota corresponde ao plano do projecto pronto. 5% da nota corresponde ao trabalho de casa e ao trabalho de grupo e cerca de 20% da nota corresponde à actividade. O conhecimento teórico é verificado numa apresentação oral sobre o plano do projecto. Quase todos os alunos inscritos passaram no curso com boas notas.

Informação adicional e referências:
http://iva.htk.tlu.ee/organizer_index
user AastaKursus05
password AastaKursus05

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Auxiliares de estudo na Educação Vocacional (Estónia)

Nome do caso:
Study Aids in Vocational Education

Universidade, departamento e país:
Universidade de Tallinn, Departmento de Ciências Sociais, Estónia

Contexto de estudo (nível de estudos, assunto):
O objectivo do curso é providenciar uma visão dos manuais de apoio ao ensino e o seu papel no processo de estudo. É um curso importante para alunos de bacharelato.

Público-alvo:
O público-alvo deste curso são os alunos do segundo ano do bacharelato em Pedagogia Vocacional. Na verdade o curso é realizado de forma independente para dois públicos-alvo diferentes: para os alunos de BA em geral e para os alunos de educação à distância. Este último grupo consiste normalmente em professores de educação vocacional com experiência que necessitam da qualificação como professores. O número de alunos depende da admissão e desistência de alunos, mas normalmente a dimensão média do grupo é de 25-30 alunos. O curso é obrigatório para todos os alunos de BA que estejam a especializar-se em pedagogia vocacional. Os alunos de outras faculdades e departamentos podem frequentar também este curso, mas até agora isso ainda não aconteceu.

Descrição:
O curso aborda os seguintes tópicos: tipos de auxiliares de ensino, o seu propósito e requisitos didácticos. Armazenamento e desenvolvimento de auxiliares técnicos de ensino. O projector de vídeo e o *software* de apresentações. Avaliação de portfólios. Compilar e resolver tarefas complicadas e problemas. Gravação vídeo e o seu uso nas aulas. Usar a câmara de vídeo para gravação e análise das actividades de aprendizagem. Critérios e instrumentos de avaliação. Direito de propriedade intelectual para manuais de apoio, iniciativas de programas de acesso livre para cursos e conteúdos. Inquéritos e auto-testes electrónicos, seus princípios de base, requisitos didácticos e normalização.

Abordagem pedagógica:
Apesar de não have uma abordagem pedagógica claramente definida para este curso, o programa e as actividades seguem o padrão semelhante ao da aprendizagem experimental – é suposto que os alunos experimentem ferramentas e tarefas diferentes e que reflictam depois sobre as suas acções.

Uso de tecnologias:
Durante o curso é usado sobretudo software open source e gratuito:

- Acrobat Reader
- HotPotatoes
- Audacity
- eFormular
- Ambiente electrónico de aprendizagem IVA

Método de combinação:
Cerca de 50% do tempo dispendido pelos alunos em actividades de aprendizagem é destinado a actividades de aprendizagem à distância no ambiente virtual do IVA. Cerca de 25% do tempo de estudo é usado em actividades presenciais, que são distribuídas de forma igual entre lições, tarefas individuais e colaborativas na sala de computadores.

Conclusões e resultados da avaliação:
A taxa de conclusão do curso foi desde sempre elevada; a maior parte dos alunos envolvem-se muito nas actividades de aprendizagem. Segundo o que alguns alunos mencionaram, ficaram muito satisfeitos com o curso porque tiveram a oportunidade de aprender a usar o *software* e equipamento técnico que seria difícil de aprender a usar por iniciativa própria. Os alunos mencionaram ainda a possibilidade de entrar em contacto com o professor, o que lhes facilitou a conclusão do curso.

Informação adicional e referências:
http://www.tlu.ee/~heidi/HotPot
http://www.tlu.ee/~heidi/Audacity

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Conclusão

Este manual providencia algumas noções sobre *Blended Learning*. Tal como foi repetidamente mencionado, nem a designação nem a tendência são novas. A formação nas empresas americanas tem usado aplicações de *Blended Learning* já há muito tempo. Todavia o ensino superior europeu tem uma natureza mais tradicional e é mais propensa a adoptar todo o tipo de inovações com mais cepticismo. O reinado do *Blended Learning* é desafiante, especialmente no contexto das mudanças que ocorrem no ambiente do ensino superior europeu.

O presente relatório disponibiliza uma panorâmica da literatura e investigação publicadas sobre *Blended Learning*. Os relatórios de investigação descrevem diferentes oportunidades para usar a metodologia do *Blended Learning*, discutindo-se as questões do 'como?' e do 'porquê?'. Descrevem-se as oportunidades e benefícios, bem como os potenciais revés. Mas a publicação dos relatórios de investigação teve sobretudo a intenção de dar uma breve mas abrangente ideia da experiência com *Blended Learning* realizada até agora.

A segunda parte deste relatório descreve experiências pontuais de *Blended Learning* em cinco países europeus – Estónia, Finlândia, Lituânia, Noruega e Portugal. Esses exemplos, que são todos derivados da prática diária em instituições de ensino superior, seja boa prática ou talvez apenas boa experiência, ilustram bem o valor do *Blended Learning*. A nossa intenção ao apresentar esses casos é em primeiro lugar encorajar os professores nas universidades tradicionais a encontrar ideias inovadoras para aplicar e ensinar num modo tão fácil quanto aceitável e também mostrar que o *Blended Learning* é fácil, proveitoso e divertido para os alunos. O *B-Learn Project* foi criado para passar a mensagem encorajadora aos docentes em ambientes universitários tradicionais de que usar o *Blended Learning* nas suas práticas pedagógicas diárias pode ser fácil e prático. O grupo parceiro neste projecto espera que esta rápida introdução aos modelos, teorias e boas práticas de *Blended Learning* apresentados no presente capítulo tenha despertado algumas boas ideias para começar a fazer combinações no seu ensino e aprendizagem. A nossa esperança mais optimista é que na sequência da publicação deste relatório irão surgir muitos novos actores no palco do ensino superior europeu que quererão fazer experiências com as novas tecnologias e que acreditarão no *Blended Learnin*g.

Kombineeritud õpe:

Valik uuringuülevaateid ja kasulikke näiteid.

Sisukord

Eessõna

Projekt B-Learn kavandati eesmärgiga kaasa aidata kõrghariduses traditsioonilise õppe ja tehnoloogiliste vahendite toel läbi viidava õppe integreerimisele. Projekti idee sündis tingimustes, kus osalevate ülikoolide e-õppe tugipersonal (haridustehnoloogid, IT-tugiisikud, tuutorid) olid oma igapäevatööga – õppejõudude abistamisega e-kursuste loomisel – ülekoormatud ja vajasid abivahendit, mis võimaldaks õppejõududel kombineeritud õppe kursuste ettevalmistamisega iseseisvalt hakkama saada. Sellega vähenenuks ka haridustehnoloogide hõivatus. Selliseks abivahendiks kavandati EPSS – elektrooniline tugisüsteem õppekursuse loomiseks (inglise keeles *Electronic performance support system*). Projekti teine pool – teadustöö tulemuste ja praktilise tegevuse ühendamine – pakub hea võimaluse nn teadusülikoolides liigselt traditsioonilistele meetoditele ülesehitatud õppetööd atraktiivsemaks muuta. Järgnevatel lehekülgedel ongi võimalik tutvuda mõnede läbiproovitud lahendustega kombineeritud õppe (inglise keeles *blended learning*) kasutamiseks.

Käesoleva kogumiku koostajad – Sofia Torrao Porto Ülikoolist ja Saima Tiirmaa-Oras Tartu Ülikooli avatud ülikooli keskusest on tänulikud kõikidele raamatu valmimisse oma panuse andnud projektipartneritele. Projekti meeskonda kuulusid lisaks eelpoolnimetatuile veel:

Jyri Manninen Helsinki Ülikoolist (Palmenia keskus);

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Mart Laanpere Tallinna Ülikoolist;

Harald Haugen, Bodil Ask ja Svein-Ove Lysne Stord/Haugesundi Ülikooli kolležist (esindavad NITOL gruppi);

Ildiko Mazar European Distance and E-Learning Network (EDEN);

Vilma Ruta Mušankoviene, Danguole Rutkauskiene ja Vida Motekaytite Kaunase Tehnikaülikoolist (Kaugõppe keskus);

Lehti Pilt, Aune Valk, Anne Villems ja Triin Marandi Tartu Ülikoolist;

ja

Karin Ruul Eesti E-õppe Arenduskeskusest.

Käesolev väljaanne on valminud Euroopa Komisjoni toel projekti B-Learn raames (225565-CP-1-2005-1-EE-MINERVA-M).

Lühike sissejuhatus kombineeritud õppesse

Hea Lugeja!

Kombineeritud õppe termin on Ameerika päritolu – *blended learning* tähistas algselt erasfääri koolitusfirmade pakutud koolitust, mis ühendab traditsioonilisi õppemeetodeid ja tehnoloogiliste vahendite kaasabil läbiviidud õpet (Gynther 2005). Pedagoogika teoreetilistes käsitlustes ei ole kombineeritud õppe sisu ja tähenduse osas kuigipalju üksmeelt ning kombineeritud õppe valdkonda ei ole ühtse käsitlusena määratleda võimalik. Termini „*blended learning*" all mõistavad eri autorid varfieeruvaid asju ning tulemus on näha ka järgnevatel lehekülgedel –nimetatud termini all uuritakse tegelikkuses eri sisuga nähtusi ja kokkuvõtvat analüüsi selle õpetamisvaldkonna kohta esitada on keeruline. Käesoleva kogumiku koostajad ei pretendeeri seega ühtse kombineeritud õppe käsitluse esitamsiele. Kogumiku koostamisel lähtusime pigtem eesmärgist anda ülevaade senistest arengutest ja kasutuspraktikatest tavaõppe ja e-õppe meetodite ühendamisel.

Termini kombineeritud õpe/*blended learning* all mõistetakse kõige sagedamini auditoorse õppe ja tehnoloogiliste vahendite abil läbi viidud õppetöö segamist/kombineerimist. Praktilise kombineerimise osas eksisteerib aga mitmeid erinevaid lähenemisi. Põhiliselt keskenduvad autorid küsimusele, KUIDAS kaks nö eri edastamise moodust oskuslikult ühendada. Õige lähenemise eelduseks on kaaluda igal üksikul juhul olemasolevaid võimalusi, eeliseid, prioriteete nii auditoorsete kui tehnoloogiliste õppevahendite kasutamise puhul.

Kombineeritud õpe ei ole kõrghariduses uus nähtus. Uueks võib ehk pidada vaid arusaamisele jõudmist, kui palju on meil tegelikult olemas võimalikke komponente, mida kombineerida. Iga üksiku institutsiooni ees seisab ülesanne otsustada, tuginedes eelnevalt paika pandud valikukriteeriumidele, auditoorse ja e-õppe vahekordade üle selliselt, et saavutataks didaktiliselt õigustatuim tulemus. Mistahes kombinatsioonide puhul on kõige tähtsam keskenduda loodetavatele õpitulemustele. Õpitulemused on keskse tähendusega nii õppija, kultuuri, olemasolevate õppevahendite, (tehnoloogilise) infrastruktuuri kui ka õppetöö jätkusuutlikkuse hindamisel. B-Learn projekt seadis eesmärgiks pakkuda lahendusi traditsioonilise ja tehnoloogiatel põhineva õppetöö integreerimiseks.

Projekti töö keskendus võimaluste otsimisele õppejõududele, õpetajatele ja koolitajatele innovaatiliste , aga samal ajal ka lihtsate ja õppijaile sobivate lahenduste pakkumiseks. Projekti raames tegeleti nii teoreetiliste käsitluste kui ka praktilise kogemuse koondamisega, eesmärgiks nagu öeldud aidata kaasa muutustele traditsioonilises kõrghariduspedagoogikas.

Käesolevas kogumikus on kirjeldatud 14 eri kombineeritud õppe kasutajalugu kokku viiest eri Euroopa riigist – Eestist, Leedust, Soomest, Norrast ja Portugalist. Nende näidete toel on võimalik uurida e-õppe ja tavaõppe meetodite tulemuslike kombinatsioonide tagamaid. Praktilise poole kõrval annavad teoreetiliste materjalide ülevaated aimdust ka sellest, milline on kombineeritud õppe teoreetiline taust, milliseid projekte on kombineeritud õppe arendamiseks loodud ja kuidas on eri riikides ja taustsüsteemides – kõrghariduse eri valdkondades või kommertskoolituses häid lahendusi leitud.

Projektis osalejad usuvad, et see tutvustav materjal kombineeritud õppe mudelite, teooriate ja praktilise kasutamise kohta aitab kaasa edasisele didaktiliste käsitluste arendamisele ennekõike tehnoloogiliste vahendite kasutamise vaatepunktist. Käesoleva kogumiku aga ka B-Learn projekti raames loodud elektroonilise tugisüsteemi kasutajana näeme ennekõike kõrgkoolide õppejõude, õppijaid ja haridustehnolooge. Aga ka kõikvõimalike teiste valdkondade – kutse- ja üldhariduskoolide, koolitusfirmade ja kolmanda sektori – koolitajad leiavad loodetavasti midagi, mida enda töös praktiliselt järele proovida. Käesoleva kogumiku koostajate tänusõnad kuuluvad inimestele, kes projekti raames meiega koos töötasid, andmeid kogusid ja analüüsisid. Eriliselt tahame aga tänada neid õppejõude, kes olid valmis oma kombineeritud õppe kogemust kirjeldama ja meie lugejatega jagama. Loodame, et selle kogumiku sisuga tutvumine annab ka sulle häid ideid kombineeritud õpetamiseks ja õppimiseks.

Kombineeritud õppe teooriad

Sissejuhatus

Selles peatükis esitatakse kirjanduse ülevaade kombineeritud õppe teoreetilistest käsitlustest. Peatükk on jagatud kolme ossa: esimeses osas antakse ülevaade kasutusel olevatest terminitest ja definitsioonidest, teine osa keskendub pedagoogikateooriatele, milles kombineeritud õpet. Kolmandas osas on vaatluse all kombineeritud õppe käsitused ühe didaktilise meetodina. Peamine kirjanduse analüüsi põhjal tehtav järeldus on see, et kombineeritud õppe käsitlused ei ole kontseptualiseeritavad ühtse ideena. Kasutusel on palju eri arusaamu ning tulemusena käsitletakse uurimustes õppetöö eri aspekte.

Mis on kombineeritud õpe?

Kombineeritud õppe teooriat on käsitletud paljudes pedagoogikaraamatutes ja artiklites. Termini endaga on tähistatud õppimise ja õpetamise eri aspekte. Termini kasutamist lähemalt uurides on ilmne, et pole olemas ainult ühte ja ainsat definitsiooni või käsitlust, mis selle termini olemust avaks. Teine tõdemus, mis kombineeritud õppe termini kasutamispraktikate uurimisega otseselt seondub, puudutab tõlkeproblemaatikat. Inglisekeelsele terminile *blended learning* ei ole teistes keeltes sageli leitud üheselt arusaadavat vastet. Tulemusena peame tegelema ka küsimusega, kas sisult sarnastel teemadel, ent mitte otseselt kombineeritud õppena defineeritud nähtused, liigituvad käesoleva uurimisteema alla. Ülevaate koostajad lähtusid kokkuleppest, et kui käsitlused vastavad sisult kombineeritud õppe kriteeriumidele, siis peaks need analüüsimaterjalide hulka kuuluma, isegi kui otsesõnu *blended learning*'ut neis ei mainita. Teisalt tähendanuks töö väga mahuka tekstimaterjali liigitamisega projekti jaoks ülejõukäivat metodoloogilist väljakutset ning lõpptulemusena on käesolevas kogumikus esitatud andmed valitud vaid nende materjalide põhjal, milles kasutakse otseselt terminit *blended learning*.

Sarnaselt paljude teiste autoritega väidab Gynther (2005), et lõhe auditoorse ja virtuaalse õppe vahel on kadumas. Juba lähitulevikus on kogu õppetöö toetatud vähemal või rohkemal määral digitaalsete ja internatipõhiste lahendustega. Virtuaalne dimensioon on leidmas oma kohta erinevates hariduse dimensioonides, kas siis alles katsetuste või juba igapäevase rakendamise vormis.

Termini „*blended learning*" juured on Ameerika Ühendriikides. Termin tähistas algselt traditsioonilise õppetöö ja tehnoloogilistel lahendustel baseeruva õppetöö kombinatsiooni, olenemata pedagoogilisest meetodist ja tehnoloogia valikust.

Josh Bersin (2004) defineerib oma raamatus „*The Blended Learning Book: Best Practices, Proven Methodologies and Lessons Learned*" (Kombineeritud õpe: parimad näited, järeleproovitud metoodika ja kasutajate õppetunnid) kombineeritud õppe kui eri koolitusmeediumite (tehnoloogiad, tegevused, sündmused) kombinatsiooni optimaalse koolituse loomiseks konkreetsele auditooriumile. Bersin kasutab terminit kombineeritud õpe viitamaks traditsioonilise loenguvormis koolituse laiendamisele elektrooniliste formaatide kaasamisega. Seejuures kasutatakse kombineerimisel e-õppe erinevaid võimalusi. Nagu Bersin, nii ka paljud teised autorid keskenduvad oma käsitlustes ennekõike erasfääri koolitustele ja juhendmaterjali stiilis raamatutele. Kaye Thorne (2003) kirjeldab kombineeritud õpet kui kõige loogilisemat ja loomulikumat õppemetoodika arengut. Tema arvates on kombineeritud õpe „elegantne lahendus" individualiseeritud koolituse jaoks, mis loob võimaluse innovaatilise ja tehnoloogilisi uuendusi ärakasutava virtuaalse õppe ja suhtlemise ning osalemise eeliseid kätkeva auditoorse õppe ühendamiseks. Kombineeritud õppe kõige olulisemaks koostisosaks on vaatamata tehnoloogiliste võimaluste atraktiivsusele ikkagi koolitaja personaalne kohaolu.

Thorne'i raamatus „*Blended learning: how to integrate online & traditional learning*" (Kombineeritud õpe: kuidas integreerida online ja traditsioonilist õpet) defineeritakse kombineeritud õpe kui segu auditoorsest õppest ja personaalsest juhendamisest ning tehnoloogiliste vahendite kasutamisest (nagu näiteks multimeediatehnoloogiad, CD ROM video, virtuaalsed klassiruumid, e-kirjad,

voicemail, konverentskõned, animeeritud tekstid ja videostriiming). Nagu juba mainitud, on paljud kombineeritud õppe raamatud sisult juhendmaterjalid ennekõike erafirmade koolituste läbiviimiseks. Põhiteemaks on seejuures küsimus, kuidas firmad saavad oma koolitusprogramme muuta efektiivsemaks ning aja- ja ressursikulude mõttes optimaalsemaks. Sellised raamatud on sageli hästi informaalsed ja mitteakadeemilist laadi, keskendudes probleemipüstitustele nagu "Kuidas kombineeritud õpe sind aitab?", „Kas see sobib sinu firmale?", „Kuidas seda rakendada?". Neis raamatuis propageeritakse kombineeritud õpet kui meetodit, mis lahendab kõik senised probleemid firmakoolituses.

Loomulikult leiab ka akadeemilisemat laadi käsitlusi. Näiteks Whitelock & Jelfs
(2003) on pühendanud kombineeritud õppele ajakirja erinumbri, kus nad esitavad kombineeritud õppe jaoks kolm eri definitsiooni:

1. Integreeritud kombinatsioon traditsioonilise õppe ja veebipõhise õppe vahenditest;
2. Kombinatsioon eri meediast ja vahenditest, mida rakendatakse e-õppe keskkonnas; ja
3. Kombinatsioon eri pedagoogilistest lähenemistest, sõltumata õpitehnoloogiatest.

Neist kolmest kõige levinumaks interpretatsiooniks peetakse just esimest (Singh, viidatud 2003 Oliver ja Trigwell 2005). Ka 2. definitsioon on laialt kasutamist leidnud, ehkki sageli jäetakse välja virtuaalse keskkonna tegur ja keskendutakse pigem eri vahendite kombinatsioonidele.

Singhi pakutud 3. defineerimisvõimalus tundub kõige laiahaardelisem, võimaldades kaasata mh ka erinevaid õpistrateegiaid. Kombineerida võib seejuures näiteks sünkroonset ja asünkroonset õppetööd, iseseisvat ja klassiruumis toimuvat, ühisõpet, struktureeritud ja struktureerimata, etteantud ning juhuslike materjalide toel toimuvat õpet jne.

Veel üks lähenemine, mida esindavad Kerres ja De Witt (2003), käsitleb kombineeritud õpet kui eri didaktiliste meetodite ja esitusformaatide kogumit. Nende argumentatsioon põhineb eeldusel, et õpetamismeetodid ja vahendid sisu esitamiseks on teineteisest sõltumatud.
Another approach is presented by Kerres & De Witt (2003). They discuss blended learning as a mix of different didactic methods and delivery formats. Their argumentation is based on the assumption that these two are independent of each other.

Veel üks lähenemine, mida esindavad Kerres ja De Witt (2003), käsitleb kombineeritud õpet kui eri didaktiliste meetodite ja esitusformaatide kogumit. Nende argumentatsioon põhineb eeldusel, et õpetamismeetodid ja vahendid sisu esitamiseks on teineteisest sõltumatud.

Driscoll (2002) on oma raamatus välja toonud neli kombineeritud õppega seonduvat kontseptsiooni: 1. veebipõhiste tehnoloogiate kasutamine hariduslike eesmärkide saavutamiseks;

2. Pedagoogiliste voolude (nt konstruktivism, biheiviorism, kognitivism) kombineerimine optimaalse õpiprotsessi saa vutamiseks, olenemata tehnoloogiliste vahendite kasutamisest;
3. Haridustehnoloogiliste vahendite ja auditoorse õppe kombineerimine; ja
4. Haridustehnoloogiliste vahendite kombineerimine reaalse(te) tööülesanne(te)ga.

Driscolli sõnul näitab asjaolu, et "kombineeritud õpe tähendab eri inimeste jaoks eri asju, selle õppemeetodi senini kasutamata potentsiaali".

Hofmanni (2001) definitsiooni on peetud märksa täpsemaks. Viimane toonitab, et „kombineeritud õppe tagamõtteks on haridustehnoloogi oskus jagada kursus mooduliteks ja valida sobivaim meedium iga mooduli läbimiseks".

Oliveri ja Trigwelli ajakirja erinumbris tutvustatakse teiste hulgas ka Valiathani (2002) definitsioone kombineeritud õppele:

1. Oskuste omandamisele suunatud õppeprotsess, mille puhul kombineeritakse õppija iseseisvat tööd auditoorse, õppejõu poolt läbi viidava õppetööga, eesmärgiga omandada **konkreetseid teadmisi ja oskusi**;
2. Suhtumise kujundamisele suunatud õppeprotsess, mille puhul kombineeritakse erinevaid sündmusi ja meediume, saavutamaks **kindlat käitumist**; ja
3. Kompetentside omandamisele suunatud õppeprotsess, mis ühendab tegevusi toetavaid tehnoloogilisi vahendeid isikliku juhendamisega, saavutamaks vajalikke **oskusi töökohal**.

Kokkuvõtvalt: Oliver ja Trigwell väljendavad oma kriitilisust praktiliselt kogu kombineeritud õppe diskussiooni suhtes. Nende väitel on erinevates kombineeritud õppe käsitlustes liialt keskendutud koolitaja ja kursuse disaineri vaatenurkadele ning õppija positsioon on jäänud piisavalt arvesse võtmata. Lisaks sellele on kombineeritud õppe teooria põhipuuduseks üheseltmõistetava arusaama ja terminoloogia puudumine.

Õpiteooriad

Järgnevalt on vaatluse all kombineeritud õppe seostamine pedagoogikateooriatega. Kombineeritud õppe teoreetilisi käsitlusi ole võimalik paigutada otseselt ühegi õpiteooria raamistikku. Pigem on tegemist meetodiga eri pedagoogiliste käsitluste raames. Erinevad kombineeritud õppe temaatikaga tegelevad kirjutised (nt Oliver and Trigwell 2005, Whitelock & Jelfs 2003) kasutavad erinevaid õpiteooriaid. Hiltz and Murray (2005) käsitlevad veebipõhist õpet kui üht loomulikku sammu pikas, algselt distantsõppe jaoks loodud sotsiaalsete tehnoloogiate arengus. Autorid loevad veebipõhise õppe rakendamist revolutsiooniliseks nähtuseks – seda nii protsessina iseenesest kui ka sotsiaalse nähtusena üldisemalt. Veebipõhist õpet kirjeldavad Hiltz ja Murray kui uut sotsiaalset protsessi, mis hakkab asendama nii kaugõpet kui ka traditsioonilist auditoorset õpet. Põhjendavad nad seda üksjagu kõrgelennulist väidet asjaoluga, et tehnoloogilised vahendid saavad kiiresti oluliseks osaks traditsioonilisest õpetamisest ning see toob endaga kaasa ka radikaalsed muutused arusaamades tüüpilise kõrghariduse olemusest.

Robertsi (2004) käsitlus kombineeritud õppest keskendub sellele, kuidas tehnoloogiatel põhinev õpe asub auditoorset loenguvormi asendama ning muudab õppimise võimalikuks ka väljaspool traditsioonilist ülikoolikeskkonda paiknevatele tudengitele. Ja mitte ainult võimalikuks, vaid ka senisest oluliselt efektiivsemaks. Oma argumentides toob autor välja kaks olulist õppeprotsessis aset leidvat suundumust. Esiteks kirjeldab ta kiiret e-toega õppe osakaalu laienemist. Teiseks rõhutab ta õppijate omavahelise suhtlemise olulisust õpiprotsessi seisukohalt ning osutab oma artiklis, et arvutitugine ühisõpe (inglise keeles *computer-supported collaborative learning* (*CSCL*)) tähistab senise tühimiku täitmist suhtlemise (*interaction*) ja õppimise vahel. Roberts ennustab arvutipõhise ühisõppe rolli olulist laienemist 21. sajandi pedagoogikas.

Thorne (2003) kirjeldab kombineeritud õpet kui viisi muuta õppimine õppija jaoks isikustatumaks. Ta viitab otseselt Haward Gardneri käsitlusele õpistiimulitele reageerimisest. Sellisest vaatenurgast lähtudes on kombineeritud õppe eesmärgiks pakkuda õppijale võimalust kasutada erinevaid tööviise ja otsustada ise oma õppeprotsessi üle sõltuvalt isiklikest õppeprotsessiga seonduvatest eelistusest.

Rida teisi pedagoogilisi lähenemisi kasutavad laialdaselt tegevusteooriat (inglise keeles *activity theory*) ja sotsiaalkonstruktivistlikku õpiteooriat (Bjarno 2005).

Taradi et al. (2005) tutvustavad kombineeritud õpet kui ühte kolmest pedagoogilisest võimalusest kõrghariduses. Need kolm on: veebipõhine õpe, probleemõpe ja ühisõpe (*collaborative learning*).

Taradi defineerib kombineeritud õpet kui auditoorse ja veebipõhise õppe kombinatsiooni õppekeskkonnas, mis on sõltumatu nii ajast kui kohast. Alonso et al. (2005) väidavad omakorda, et informatsiooni omandamise psühholoogias ja sotsiaalkonstruktivistlikus pedagoogikas on viimase aja oluliseks arenguks õppe sisu struktureeritud esitamise psühhopedagoogiline õpetamismudel. Kombineeritud õpe tähistab siinjuures ennekõike õpiobjektide loogilist esitamist. Selline kontseptsioon pärineb otseselt objektorienteeritud õppe paradigmast.

Gynther (2005) toob kombineeritud õppe puhul välja didaktika seisukohalt neli olulist küsimust:

1. Missugune on teadmine, mida õppija vajab ja mis laadi pedagoogilisi vahendeid on selle saavutamiseks vaja?
2. Kuidas korraldada õppija „ruum"?
3. Kuidas luua õppimiseks vajalik õhustik (*learning milieu*)?
4. Millised vahendid on õppejõule vajalikud eelpoolkirjeldatud valikute toetamiseks?

Nagu juba korduvalt öeldud, tähistab kombineeritud õpe selle termini kõige enamkasutatavas tähenduses traditsioonilise õppe ja veebipõhise õppe segu. Gynther aga väidab, et see, ameerikalik arusaam kombineeritud õppest on liiga laialivalguv. Gyntheri hinnangul tuleks kombineeritud õppe mõiste siduda otsesemalt konkreetse didaktilise metoodikaga. Samuti väidab ta, et eelpoolloetletud küsimustele vastuste leidmine on õppejõu jaoks oluline eeltöö uue õpetamismudeli disainimisel. Autor pakub välja, et kombineeritud õppe termini kasutamisel ei peaks rahulduma pelgalt auditoorse ja e-õppe segamise ideega. Kombinatsioon peaks sisaldama ka õppetöö sisu ja pedagoogiliste meetodite dimensioone ja sisulist arusaama sellest, milliste tehnoloogiliste vahendite kasutamine on õigustatud konkreetse õppemeetodi ja õppesisu puhul. Oluline on eelistada just neid tehnoloogilisi lahendusi, mis toetavad valitud didaktilisi meetodeid. Auditoorne töö on muutunud vaid üheks paljudest võimalustest õppimise ja õpetamise läbiviimisel. (Kõrg)hariduse põhimõtteline muutumine paneb haridust andvatele asutustele uut tüüpi kohustused, seda nii sisu kui ka õppija muutumise tõttu. Koolitusturul mängivad märksa suuremat rolli uut tüüpi õppijad, kes vajavad paindlikumat koolitust, seega peab muutuma ka kursuste õpidisain. Tulemuseks ongi, et kombineeritud õpe ei ole paradigmaatiliselt mitte iseseisev, vaid pigem üks hariduse vahendamise viise eri pedagoogiliste mudelite sees. Seega peaks kombineeritud õppest rääkimagi mitte kui õpetamise meetodist, vaid ühest mudelist eri pedagoogilistes käsitlustes.

Kombineeritud õpe: eri lähenemisviisid.

Kuivõrd kombineeritud õpe on üldlevinud tähenduses mõistetud auditoorse ja tehnoloogiliselt vahendatud õppetöö seguna ning teisalt kirjeldatud ühe lähenemisviisina pedagoogiliste mudelite sees, siis on huvipakkuv lähemalt vaadelda kombineeritud õppe erinevaid lähenemisviise teoreetilistes käsitlustes. Hiltz ja Murray (2005) leiavad, et auditoorse ja e-õppe oskusliku kombineerimise tulemusena tõuseb märgatavalt õppijate hinnang õppetööle. Samas sõltub see tagasiside ka mitmetest sotsiaalsetest teguritest.

Bersin (2004) pakub välja kaks eri lähenemisviisi ja tõdeb, et kombineeritud õppe peamine eesmärk on integreeritud lõpptulemuse saavutamine. Oskuslikul kombineerimisel on võimalik saavutada tegelikele vajadustele vastav õpitulemus. Ennekõike on tehnoloogiliste vahendite kasutamine mõeldud traditsioonilist õpet toetama. Samas võib kombineeritud õpe olla ka e-õpet tugevdav edasiarendus, mis tagab läbinisti e-vormis toimuva õppe parema kvaliteedi tänu sotsialiseerimisprotsessi ja motivatsioonisüsteemi paranemisele. Siit tuletabki Bersin oma kaks eri lähenemisviisi kombineeritud õppele:

1. "Sujuva õppeprogrammi" mudel: üksikasjalikult planeeritud kursus, milles on integreeritud erinevad meediumid ja lõpptulemuseks on kronoloogilises järgnevuses õppeprogramm või kursus. Kursuse koostisosad on ülesehitatud järgnevuse põhimõttel, iga järgmise mooduli eelduseks on eelmiste läbimine. Kursus lõpeb eksami vm tulemuste hindamiseks korraldatud tööga üldise õpitulemuse mõõtmiseks. See mudel on võrreldav tavapärase kõrgkoolikursusega.
2. "Telje-ja-kodarate" mudel: üks keskne koolitus (auditoorne õppetöö või veebipõhine õppematerjal), mida toetavad lisamaterjalid, tegevused, suhtluskeskkonnad jm lisategevused, mis võivad olla nii kohustuslikud kui vabatahtlikud, ent mille põhieesmärk on keskse koolituse toetamine.

Esimene mudel tagab õppija kindla seotuse kursusega ja võimalikult suure lõpetajate protsendi. Õppija on kursusega tugevamalt seotud ja saab oma tegevused pika aja peale ette planeerida. Bersin väidab, et selle mudeli kasutamisel on õppijal võimalik kõik õppetööga seonduvad tegevused ette planeerida ja samal ajal tagab õppija pidev seotus ka tema kursuse lõpetamiseni välja jõudmise. Selle mudeli kasutamisel on õppejõul võimalik pidevalt jälgida õppija edasijõudmist ja õigeaegselt märgata iga üksiku osaleja probleeme ja tagasilööke. Bersini hinnangul on selle mudeli kasutamine õigustatud eelkõige traditsioonilise õppe puhul. See mudel sobib enamike õpetamise paradigmadega („õpi/proovi/hinda"). Sellise mudeli tulemused on kergesti hinnatavad, seda on lihtne täiendada ja läbi viia.

Teine mudel on loodud pigem üksiku koolitusprojekti jaoks, mille puhul kasutatakse ühte keskset meediumi (elektroonilist või auditoorset) ning muud vahendid ja tegevused on lisamaterjali staatuses. Õppijal on võimalik ise otsustada, millist lisamaterjali kasutada ja kõik õppijad ei ole kohustatud läbi kursust samaaegselt. Selline lähenemine eeldab õppijalt motiveeritud ja iseseisvat tegutsemist. Mudeli eeliseks on võimalus pidavaks arendustegevuseks – koolitajal on alati olemas võimalus kursuse täiendamiseks ja edasiarendamiseks (nt materjalide lisamiseks).

Petra Neumeier (2005) on uurinud keeleõppe materjalide loomist CALL põhimõttel (arvutipõhine keeleõpe, inglise keeles *Computer Assisted Language Learning*). Neumeier leiab, et kursuse loomise eelduseks on parameetrite raamistiku loomine, mis võimaldab valida konkreetsele vajadusele tuginevalt individualiseeritud ja kontekstipõhised kombineeritud õppe meetodid. Saamaks paremat ülevaadet teguritest, mis kombineeritud õppe tulemuslikkust mõjutavad, kirjeldab ta mitmeid eri tulemuslikkuse mõõdikuid (vt lähemalt Petra Neumeier 2005 *A closer look at blended learning - parameters for designing a blended learning environment for language teaching and learning*. ReCALL vol 17 no 2 :63-178).

Gynther (2005) viitab üha kasvavale vajadusele kvaliteetsema ja odavama hariduse järele. See on tihtipeale seostatud just info- ja kommunikatsioonitehnoloogiate (IKT) kasutamisega – IKT peaks tagama uuenenud ja efektiivsema õpitulemuse. Õpitulemuste muutumist ja tehnoloogia kasutamisega kaasnevaid võimalikke eeliseid tuleks aga eelnevalt analüüsida sama põhjalikult kui traditsioonilise õpetamise puhul.

Kombineeritud õppe kursusega alustamisel tuleks eelnevalt läbi mõelda järgmised aspektid:

1. Millised on auditoorse õppe eelised?
2. Millised on teadaolevad virtuaalse õppega kaasnevad ohud?
3. Milliseid õppetöö osi tuleks eelistatult kavandada auditoorsena ning millised kursuse osad on võimalik läbi viia veebipõhiselt?
4. Mille põhjal valida erinevaid (tehnoloogilisi) vahendeid ja nn vahendatud õpetamismeetodeid?

On äärmiselt oluline olla teadlik võimalikest ohtudest ja mõelda õppeprotsess eelnevalt hoolikalt läbi. Igal vahendil ja õpetamismeetodil on oma eelised ja puudused, iga valitud meetod võib nii toetada kui ka ahendada õppija ja õppejõu võimalusi materjali omandamiseks.

Gynther soovitab kombineeritud õppe kavandamisel läbi mõelda järgmised detailid:

1. Kas valitud meedium võimaldab õppijal jälgida õppejõult lähtuvat kommunikatsiooni?
2. Kas valitud meedium võimaldab õppejõul jälgida õppijalt lähtuvat kommunikatsiooni?
3. Kas valitud meedium võimaldab õppijal jälgida teiste õppijate õppetööd?
4. Kas valitud meedium võimaldab õppijal saada pidevat ülevaadet enda õppeprotsessist (tegevustest, tulemustest, jne)?
5. Kas valitud suhtlemisvahendid ja –keskkonnad tagavad õppijale valikuvõimaluse informatsiooni saamiseks ja suhtlemiseks?
6. Kas valitud suhtlemisvahendid ja –keskkonnad tagavad õppejõule võimaluse suhtlemise organiseerimiseks õppejõu ja õppija vahel? Õppijate vahel ja rühmatööde puhul?
7. Kas valitud suhtlemisvahendid ja –keskkonnad kujundavad üldise positiivse õpimiljöö?

Kombineeritud õppe kasutamine pakub õppejõule palju eri võimalusi informatsiooni edastamiseks õppijale. Sellega tagatakse õppija suurem valmisolek informatsiooni omandamiseks. Kombineeritud õpe pakub lisaks ka uusi didaktilisi võimalusi, ja oskuste tasemelt ebaühtlastes õpperühmades on õppijatele tagatud laiemad valikuvõimalused materjali omandamiseks.

Kokkuvõtvalt

Kombineeritud õppe juurutamisel on võimalik rakendada paljusid eri lähenemisi. Käesolevas peatükis kirjeldasime osa neist võimalustest. Kuivõrd kombineeritud õppe all peetakse üldjuhul silmas auditoorse ja tehnoloogiatel põhineva õppe ühendamist, keskenduvad eri autorite käsitlused suuresti sellele, **kuidas** saavutada integreeritud õppeprotsess. Sõltumata valitud mudeli struktuurist, keskenduvad kõik käsitlused ühe või mitme meediumi integreerimisele. Õppeprotsessi nähakse seejuures õppija iseseisva ja õppejõu osalusel läbiviidava õppimise kombinatsioonina. Valida on võimalik nii kronoloogilises järgnevuses kui juhuslikumat laadi valikul põhineva kursuse ülesehituse vahel; hindamiseks on võimalik kasutada nii kohustuslikke kui vabatahtlikke hindamissüsteeme. Sobivaima lähenemise valimiseks tuleb analüüsida nii olemasolevaid võimalusi, ühe või teise meetodi eeliseid ning auditoorse ja e-õppe vahendite sobivust eri meetodite ja materjalide esitamisel.

Käesolevas peatükis keskenduti kombineeritud õppe teoreetilisele taustale, termini kasutamisvõimalustele ja eri käsitlustele kombineeritud kursuste disainimisel. Esitatud analüüsil tuginesime peamiselt Oliveri ja Trigwelli (2005), Whitelocki Ja Jelfsi (2003) ja mitmete teiste autorite töödele. Peamine järeldus, mida teoreetiliste kirjutiste analüüsimisel tegime, seisneb tõdemuses, et kombi-

neeritud õppe puhul ei ole tegemist eraldiseisva pedagoogilise paradigmaga. Pigem on kombineeritud õpe vaadeldav ühe sisuedastusviisina eri pedagoogiliste mudelite raamistikus.

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Näiteid kombineeritud õppe kasutamisest Euroopa ülikoolides

Sissejuhatus

Selles peatükis uurime kombineeritud õppe rakendamise strateegiaid Euroopa kõrghariduses, samuti esitatakse näiteid mitmete kombineeritud õppe rakendus(uurimus)projektide tulemustest. Alustuseks kordame üle termini kasutuspraktika, millest oli pikemalt juttu eelmises peatükis. Seejärel on toodud andmed kombineeritud õppe kursuste kohta kõrghariduse eri valdkondades (õpetajakoolitus, keeleõpe, arstiõpe, sotsiaal- ja humanitaarteadused, inseneriõpe ja loodusteadused).

„Kombineeritud õpe" - lühike tutvustus

Whitelock & Jelfs (2003) on pühendanud kombineeritud õppele oma ajakirja erinumbri, kus nad esitavad kombineeritud õppe jaoks kolm eri definitsiooni:

1. Integreeritud kombinatsioon traditsioonilise õppe ja veebipõhise õppe vahenditest;
2. Kombinatsioon eri meediast ja vahenditest, mida rakendatakse e-õppe keskkonnas; ja
3. Kombinatsioon eri pedagoogilistest lähenemistest, sõltumata õpitehnoloogiatest.
   Neist kolmest kõige levinumaks interpretatsiooniks peetakse just esimest. (Singh, viidatud 2003 Oliver ja Trigwell 2005).

Taani päritolu teoreetik Gynther (2005) toob kombineeritud õppe kasutuselevõtul oluliste küsimustena välja järgneva:

1. Missugune on teadmine, mida õppija vajab ja mis laadi pedagoogilisi vahendeid on selle saavutamiseks vaja?
2. Kuidas korraldada õppija „ruum"?
3. Kuidas luua õppimiseks vajalik õhustik (*learning milieu*)?
4. Millised vahendid on vajalikud õppejõu eelpoolkirjeldatud valikute toetamiseks?
   Gyntheri hinnangul on vastuste otsimine neile neljale küsimusele kombineeritud õppe planeerimise oluliseks osaks.

Samal ajal väidab Bersin (2004), et auditoorse õppe põhiline puudus seisneb kaasatuse vähesuses. Kui õppejõud peab õpetama tuhandeid üliõpilasi, ei ole võimalik saavutada isiklikku kontakti kõikide üliõpilastega, veel vähem on võimalusi praktilist tegevust sisaldava õppetöö läbiviimiseks. Samuti on õppejõudude sagedaseks probleemiks ajanappus. Nende probleemide leevendamiseks ongi üheks lahenduseks tehnoloogiate kaasamine õppetöösse. Bersin usub, et kombineeritud õppe rakendamise abil on võimalik õppimise laiendamine nii ajas kui ruumis. Samuti tähendab kombineeritud õppe kasutamine haridusele juurdepääsuvõimaluste loomist märksa laiemale õppijate ringile. Seega ei ole kombineeritud õpe mitte ainult võimalus õppejõudude ajapuuduse leevendamiseks ja õppijate õppimisharjumuste muutmiseks, vaid ka haridusele võrdsete juurdepääsuvõimaluste tagamiseks (Cottrell ja Robison 2003).

Viimatikirjeldatud interpretatsioon kannab endas märksa laiemaid sotsiaalseid mõjusid. See ei tähenda ainult rohkemate tudengite liitumist kõrgharidussüsteemiga, vaid – nagu Aspden ja Helm (2004) kirjeldavad – virtuaalsete õpikeskkondade olemasolu muudab oluliselt ka olemasolevaid õpetaja ja õppija suhteid ja suhtlemisstiile. Mitmed uuringud kinnitavad, et järjest laialdasem haridustehnoloogia võidukäik mõjub lähendavalt (nii füüsiliselt kui virtuaalselt) pigem päevaste tudengite ja õppejõudude suhetele. Kaugkoolituse mahtude suurenemine on teisejärgulise tähendusega. Päevase õppe üliõpilased saavad e-õppe vahendite rakendamisest kasu ennekõike tugevama kuuluvustunde tekkimisest – üliõpilased suhtlevad rohkem nii õppejõudude kui kaastudengitega. Seega võib tehnoloogiliste vahendite kasutuselevõttu vaadelda pigem tudengite võõrandumist vähendava/vältiva tegurina. Isegi kui tudengite ja õppejõudude suhtlemine toimub asünkroonsena, on füüsilise ja virtuaalse õpikeskkonna kombineerimisel ometi positiivne mõju

omandatavale õpikogemusele.

Paljud autorid väidavad, et kombineeritud õppe näol ei ole tegemist uue nähtusega pedagoogikas, uus on pigem tõdemus, et kombineeritavate komponentide loetelu on piiritu. Kombineerimise peamiseks teguriks on seejuures oskuslik kriteeriumide valik komponentide valikul ja kasutamisel. Ainult sisulisele analüüsile tuginedes on võimalik saavutada tulemuslik kombinatsioon. Mistahes kombinatsioonide puhul on kõige tähtsam keskenduda oodatavatele õpitulemustele. Õpitulemused on keskse tähendusega nii õppija, kultuuri, olemasolevate õppevahendite, (tehnoloogilise) infrastruktuuri kui ka õppetöö jätkusuutlikkuse hindamisel. Õppijatele võimalikult laialdaste valikuvõimaluste pakkumine ei saa olla õppejõu peamine eesmärk (Clark 2005).

Paljud kombineeritud õpet käsitlevad väljaanded on oma sisult juhendmaterjalid kombineeritud õppe kursuste loomiseks. Seejuures on enamik neist kirjutatud kommertskoolitust pakkuvate firmade poolt (Nt Bersin 2004, Thorne 2003 ja McGinnis 2005), nende peamine sihtgrupp on erafirmad ja keskseks teemaks koolituse muutmine efektiivsemaks ja ajaliselt ning rahaliselt optimaalsemaks. Neis kommertssuunitlusega kirjatöödes kirjeldatakse kombineeritud õpet kui nähtust, mis lahendab peaaegu kõik väljaõppe ja koolitamise probleemid. Sellised raamatud on sageli hästi informaalsed ja mitteakadeemilist laadi, keskendudes probleemipüstitustele nagu “Kuidas kombineeritud õpe sind aitab?”, „Kas see sobib sinu firmale?”, „Kuidas seda rakendada?”. Neis raamatuis propageeritakse kombineeritud õpet kui meetodit, mis lahendab kõik senised probleemid firmakoolituses.

Traditsiooniliste akadeemiliste institutsioonide jaoks on sarnaste käsitluste leidmine juba märksa keerulisem. Akadeemilised käsitlused keskenduvad pigem seniste kombineeritud õppe projektide analüüsile eesmärgiga välja selgitada, kas kombineeritud õppe kasutamine on toonud kaasa positiivseid arenguid õpitulemustes (vt näiteks Taradi et al. 2005, Bjarno 2005, Neumeier et al. 2005, Voogt et al. 2004 ja Concannon et al. 2005, Burgon ja Williams 2003 , Motteram 2006).

Järgnevatel lehekülgedel tutvustataksegi erinevaid kombineeritud õppega tegelevaid akadeemilisi uurimisprojekte.

Näiteid kombineeritud õppe kasutamisest õpetajakoolituses

Norra Haridusseadus (UFD 1998) kehtestab koolidele kohustuse rakendada kohandatud õpet (*adapted learning*). Bjarno (2005) kirjeldab Norras läbi viidud uurimust, mille andmetel õpetajakoolituse üliõpilastel puuduvad vajalikud oskused kaasamaks IKT vahendeid oma õppetöösse. Vajalikud ei olegi niivõrd IKT-alased oskused, kuivõrd näitlikustatud õpetus selle kohta, kuidas IKT vahendeid eri õppeainete õpetamisse kaasata. Kui Norra Haridus- ja teadusministeerium töötas välja uue õpetajakoolituse õppekava, otsustas Oslo Ülikooli Kolledži IT osakond hakata tegelema IKT koolituse edendustööga õpetajakoolituses. Kogu teaduskond toetas initsiatiivi ja välja töötati projekt, mille sisuks oli interdistsiplinaarse didaktika loomine IKT vahendite kaasamiseks. Projekti eesmärgiks oli vähendada lõhet õpetajakoolituse praktikavõimaluste vähesuse ja tegelike õppetöö läbiviimisega seonduvate vajaduste vahel põhikooli ja gümnaasiumi tasemel. Eesmärkide saavutamiseks juurutas IT osakond kombineeritud õppe kontseptsiooni.

Bjarnø analüüsib protsessi, kus Norra õpetajakoolituse üliõpilaste jaoks koostati kombineeritud õppe kursus eesmärgiga integreerida õppekavasse IKT vahendite kasutamise oskus õpet toetava abivahendina kooliõpetaja jaoks. Tõstatus küsimus, kas IKT vahendite kaasamine tudengite õpetamisse erialakursuste raames tagab piisavad oskused toimetuleks IKT vahendeid kasutava õpetajana. Püstitatud eesmärgi saavutamiseks otsustati Oslo Ülikoolis kaasata tehnoloogilistele vahenditele tuginev õpe kõikidesse erialaainetesse. Tudengitel olid olemas eelnevad IKT-alased teadmised ja oskused, samas puudusid neil oskused, kuidas kaasata IKT vahendeid koolis õpetamise protsessi.

Püstitatud eesmärgi saavutamiseks alustas IT osakond tugiteenuse pakkumist õppejõududele IKT vahendite kaasamiseks erialakursustesse selle asemel, et pakkuda eraldiseisvaid IT-kursuseid. IKT vahendite kaasamisega igapäevasesse õppetöösse anti õpetajakoolituse üliõpilastele soodne võimalus paremate õpetajaoskuste omandamiseks. Üliõpilased said kasutada õppematerjale järgnevatel viisidel:

1. Veebipõhise õppematerjalina;
2. Auditoorse loengu vormis (maksimum 50-inimeselistes rühmades);
3. Arvutiklassis juhendaja juuresolekul (maksimum 30-inimeselistes rühmades).

Loengud toimusid eri teemadel ning sisaldasid mh ka veebipõhiseid õppematerjale ja ülesandeid. Samuti sai kasutada mitmeid eri meediumitel põhinevaid õppematerjale, nagu näiteks videojuhendid, animatsioonid, pildid ja helifailid . Kõik need materjalid olid seotud ka arvutiklassis toimuva juhendamisega. Kirjeldatud õppeprotsessi läbiviimiseks oli vajalik ühe videoprojektoriga arvuti ning iga õpilase personaalse arvutiga varustatud töökoha olemasolu arvutiklassis. Projekti tulemused näitasid, et tulemusliku IKT-vahendite integreerimise eelduseks on toimiv dialoog IT-osakonna ja sisulise aineõpetusega tegelevate õppejõudude vahel. Erialaainetesse IKT vahendite lülitamise tulemusena liikus IKT-alase õppetöö rõhuasetus kindlalt piiritletud loengutelt uute õppetöö vormide poole. Oluliselt suuremat tähelepanu hakati pöörama tudengite individuaalsele juhendamisele ja sellega seoses suurenes ka isiklike kontakttundide maht tudengi ja õppejõu vahel. Kirjeldatud projekti elluviimise suurimaks väljakutseks oli infrastruktuuri loomine. Kõikide erialaainete läbiviimiseks muutus vältimatuks eeltingimuseks arvutite ja tarkvara, aga ka videoprojektorite olemasolu.

Projekti tulemused kinnitavad, et õppijad hakkasid õppetööd kõrgemalt hindama. 21% osalenud tudengeist kinnitas, et IKT tunnid ja juhendamine on otstarbekam kui varem. Bjarno tõstab oma analüüsis esile kirjeldatud moel kombineeritud õppe rakendamise positiivset tulemust – liikudes eraldi erialateadmiste ja IKT õpetamiselt kombineeritud õpetamisele, paranevad ka õpetajate oskused IKT rakendamiseks oma hilisemas erialases töös.

IKT-vahendite kasutamise oskus ei ole oluline mitte ainult õpetajakoolituse tudengitele. Ka Voogti juhitud uurimuses (2004) viidatakse üleüldisele oskuste puudumisele IKT vahendite rakendamiseks koolis. Tegelikkuses on õpetajate potentsiaal tehnoloogilisi vahendeid kasutada lihtsalt realiseerimata. Voogti uurimisrühma eesmärgiks oli tõsta „kombineeritud" tugiteenuste taset gümnaasiumiõpetajate seas õppetöö läbiviimisel ja tehnoloogiliste vahendite kaasamisel. Selleks korraldati töötubasid, koostati näidismaterjale ja pakuti arvutipõhist tuge. Kombineeritud õppetöö juurutamine õpetaja professionaalse arengu toetamiseks andis selle projekti raames positiivseid tulemusi.

Õpetajakoolituse tudengite jaoks on praktika üks olulisemaid õppetöö osasid. Motteram (2006) kirjeldab arendustööd õpetajakoolituse magistriõppekavaga Manchesteri Ülikoolis. Läbiviidud projekti tulemused tõendasid, et kombineeritud õppe rakendamine annab olulisi tulemusi õppija oskuste ja teadmiste arendamisel, seda ennekõike tänu tasakaalustatud õppeprogrammile ja õppijate paranenud oskustele tegevuste hindamisel.

Kupetz ja Ziegenmeyer (2005) kirjeldavad õpetajakoolituse projekti, mille puhul kaasati emakeeleõpetaja õppekava üliõpilaste õppeprogrammi mini-praktika, mis seisnes lühikeses klassi ees õpetamise harjutamises. Juurutatud põhimõtte aluseks oli situatiivse õppimise teooria rakendamine multimeedia vahendite toel. Tegevuste hulka kuulusid klassitundide salvestamine ja multimeedial põhinevad kaasuste esitamised ning elektrooniline ekspertintervjuu pikaaegse kogemusega algkooliõpetajaga. Praktika sisaldas juhendmaterjale, iseseisvat õpetajakogemust koos eelneva õppetöö planeerimise protsessiga.

Juhtumi analüüside kasutamine õpetamismeetodina oli põhjendatud selgema sideme loomisega teoreetilise ja praktilise õpetajakoolituse vahel. Multimeedia vahendite abil loodud juhtumite kirjeldused kujutasid endast arvutipõhiseid õpimooduleid, mis toetasid õppijate erinevaid õpistiile. Juhtumi kirjeldustega tuli õppijatel töötada kursuse jooksul mitmeid kordi kas iseseisvalt või õppejõu juhendamisel. Projekti üheks tulemuseks oli ka erinevate õpistiilidega õppijate kirjeldamine: kogemuste põhjal õppijad, teoreetilise materjali baasil õppijad ja õppijad, kes keskenduvad erinevate õppimisvõimaluste valimisele ja rakendamisele.

Näiteid kombineeritud õppe kasutamisest keeleõppes

Keeleõppe eelduseks on nii õpetaja kui ka õppija aktiivne osalemine. Seega ei ole tehnoloogiliste vahendite kasutamine keeleõppes ainult pedagoogi õpetamismeetodi küsimus, vaid suure tõenäosusega tähendab ka otsest kasu õppija õpitulemusi silmas pidades ja kursuse läbimõeldud disainimine toob kasu mõlemale osapoolele.

Petra Neumeier (2005) on uurinud keeleõppe läbiviimist seoses CALL-materjalide (arvutipõhine keeleõpe, inglise keeles *Computer Assisted Language Learning*) koostamise, disainimise ja rakendamisega õppetöös. Neumeier leiab, et kursuse loomise eelduseks on parameetrite raamistiku loomine, mis võimaldab valida konkreetsele vajadusele tuginevalt individualiseeritud ja kontekstipõhised kombineeritud õppe meetodid. Saamaks paremat ülevaadet teguritest, mis kombineeritud õppe tulemuslikkust mõjutavad, kirjeldab ta mitmeid eri tulemuslikkuse mõõdikuid. Autor pakub välja parameetrid, mis on koondatud Müncheni Ülikoolis JoblineLMU projekti raames:

Parameeter	Kirjeldus
1. Edastusviis	• Keskendu edastusviisi valikule • Vali õiged vahekorrad • Olemasolevad võimalused
2. Integreerimismudel	• Meetodite järgnevuse valik • Integratsiooni ulatus
3. Sisu jaotamine	• Paralleelne või isoleeritud
4. Keeleõppe metoodika	• Õpetamismeetodi valik iga edastusviisi jaoks eraldi
5. Osalejate kaasamine (õppijad, tuutorid, õpetaja)	• Interaktsioon: iseseisev vs. rühmatöö • Õpetaja ja õppija rollide mitmekesisus • Iseseisvuse ulatus
6. Asukoht	• Auditoorium, kodu, õuesõpe, arvutiklass, aga ka organisatsiooni tugi

Need parameetrid kirjeldavad keeleõppe seisukohalt olulisi tegureid kombineeritud õppe õnnestumiseks (Neumeier 2005, lk 167). Neumeier leiab, et kui loetletud parameetreid arvestada ja positiivselt ellu rakendada, on tulemuseks ka keeleõppe kogukonna (õpetajad, õppijad, CALL-metoodika eksperdid) üldine areng.

Järgmisena tutvustame keeleõppe projekti, mis viidi läbi Suurbritannias vähemusrahvuste keeleõppe edendamiseks. Harker ja Koutsantoni (2005) kirjeldavad veebipõhise õppeprogrammi loomist kursuse *English for Academic Purposes* (EAP) jaoks. Õppijad osalesid 9-nädalase programmi jooksul kahes eri rühmas: üks rühm kaugõppe ja teine kombineeritud õppe vormis. Projekti tulemuste analüüs näitas, et kombineeritud õppe eeliseks oli tudengite suurem seotus õppetööga kogu programmi vältel, samal ajal kui õppijate lõpphindele (õpitulemustele) ei avaldanud valitud õpimeedium olulist mõju. Veelgi enam, õppijate tagasiside põhjal ei olnud erinevusi ka õppija rahulolus.

Näiteid kombineeritud õppe kasutamisest arstiõppes

Ellis et al. (2006) on analüüsinud suhtlemise kaudu (nii näost-näkku kui veebipõhiselt) omandatud õpikogemusi. Analüüsiti 2. aasta sotsiaaltöö tudengitele mõeldud psühholoogia kursusel osalemist. Õpetaja kujundas diskussiooniülesanded, mis algasid auditoorse sessiooniga ja jätkusid internetis. Õpitulemuste hindamiseks koostasid uurijad vabavastustega küsimustiku ning viisid läbi poolstruktureeritud intervjuud. Uurimisteemad sisaldasid õppijate arvamust sellest, mida nad kursuse käigus omandasid, millised olid nende eesmärgid ja kuidas nad mõtestasid diskussiooni vormis õppimist. Küsitluste ja intervjuude käigus saadud andmetele tuginedes toodi välja rida sisult erinevaid diskussioonimeetodiga seonduvaid arvamusi ja seostati need ka õppija lõpphindega. Autorid leidsid, et sügava õppimisstiiliga ning samuti hea seostamisvõimega õppijad saavutasid kursusel paremaid lõpptulemusi. Samal ajal ei leitud statistiliselt olulist erinevust auditoorse diskussiooni ja lõpphinnete seostes sügavate/pinnapealsete õppijate vahel.

Daviese uurimisrühm (2005) tegeles traditsioonilise auditoorse õppe ja arvutipõhiste õppematerjalide kombineeritud kasutamise efektiivsuse analüüsiga Birminghami Ülikooli psühhoteraapia magistriüliõpilaste neuroloogiaalaste vaatlemis– ja analüütiliste oskuste arendamisel. Arstiteaduskonnas loodi rida uusi õppevahendeid ja õpiobjekte WebCT keskkonnas kasutamiseks ja lisaks suur hulk videomaterjali neuroloogiliste probleemidega patsientidest (kasutamiseks CD-ROMil). Nende ressursside kasutamine võimaldas tudengitel vaadelda „päris patsiente" enne tegelikku kliinilise töö keskkonda asumist. Sellega vähendati lõhet õppijate teoreetiliste teadmiste ja praktilise diagnoosimise kogemuse puudumise vahel.

Arstiteaduse valdkonda kuulub ka järgmine näide. Guldberg ja Pilkington (2006) analüüsisid
täiskasvanud õppijate arengut veebipõhises õpikogukonnas. Analüüsi aluseks oli valik veebipõhiste diskussioonide näiteid. Uurimistulemused kirjeldasid erineva kogemusega õppijate (näiteks lapsevanemad, autistlike häiretega isikute tugiisikud jne) koostööoskusi ja võimet luua ühiseid seisukohti. Täiskasvanud õppijate laialdased kogemused toetasid õppija koostöövõimet kursuse raames. Diskusioonirühmade käigus tugevnes grupiidentiteet ja keerulisemate ülesannete lahendamine ei olnud õppijate jaoks keeruline.

Näiteid kombineeritud õppe kasutamisest sotsiaal- ja humanitaarteadustes

Nii sotsiaal- kui ka humanitaarteaduste üheks olulisemaks osaks on tekstilise materjali loomine. Selleks otstarbeks arvutite kasutamine on juba pikka aega küllalt tavapärane praktika.

Cox et al. (2004) uurimisrühm tegeles *online* jututubade kasutamise pedagoogilise tulemuslikkuse võrdleva uurimisega humanitaarteaduste magistrikursuse ja viimase aasta kaubanduse eriala üliõpilaste seas. Autorid leidsid, et kombineeritud õppe kasutamine auditoorse ja veebipõhise õppe vormis (läbimõeldud kursuse õpidisain, grupidünaamika, vahendamisstiilid) tagas märksa parema osaluse diskussioonides võrreldes ainult auditoorse õppe kasutamisega.

Webb et al. (2005) analüüsisid nelja erinevat semestripikkust koolitust infosüsteemide halduse magistrikursusel. Koolitused koosnesid nii auditoorsest kui ka veebipõhisest osast. Autorite hinnangul tagab parema õpitulemuse mitte tehnoloogiliste vahendite kasutamine iseenesest, vaid ennekõike õige vahekorra leidmine eri vahendite kasutamisel ning mõistmine, millise õpetamismeetodi puhul millist keskkonda kasutada. Uuringu tulemused näitasid veebipõhises keskkonnas juhtumi analüüsi meetodi kasutamise positiivset mõju kursusel osalemise määrale. Tudengite õpitulemused olid vähemalt samal tasemel võrreldes 100% auditoorse kursusega, samas olid nende õpitulemused veebikeskkonnas paremad mitmete eri hindamiskriteeriumide alusel (eriti hästi avaldus see kombineeritud õppe kasutamisel). Autorid usuvad, et juhtumi analüüsi meetod on suurema efektiivsusega just veebipõhisel kasutamisel. Ühe huvipakkuva ilminguna tõid uurimuse autorid välja, et kombineeritud õppes juhtumianalüüsi meetodi kasutamine tähendas õpetaja jaoks oluliselt suuremat ajakulu ning seetõttu tajusid õpetajad enda töö ebapiisavat väärtustamist.

Näiteid kombineeritud õppe kasutamisest tehnoloogia- ja loodusteadustes

Tehnoloogia- ja loodusteadustes peetakse IKT vahendite kasutamist märksa tavalisemaks kui reas teistes valdkondades. Samas väidavad paljud autorid, teiste seas ka näiteks Derntl ja Motschnig-Pitrik (2005), et tehnoloogiliste vahendite integreerimisele õpetamisprotsessi ei ole piisavalt tähelepanu pööratud. Nimetatud autorid analüüsisid akadeemilist veebitehnoloogia õppeprogrammi ja leidsid, et kombineeritud õppe metoodika kasutamine õigustas end ainult juhul, kui kursuse läbiviijal olid olemas head suhtlemisoskused ja kasutatavad tehnoloogia oli piisavalt lihtsalt kasutatav.

Shafferi ja Smalli 2004. aastal läbi viidud uurimus tõendas, et arvutite kaasamine õppetöö läbiviimisesse sai nii väikeste kui ka suurte õpperühmade puhul õppijate hea tagasiside osaliseks ja tagas parema arusaamise teoreetilistest teadmistest. Sellisele järeldusele jõuti kahe aasta jooksul 1. aasta arstiüliõpilastele mõeldud radioloogiakursuse analüüsil. 2002. aastal asendati kursuse läbiviimisel rühmatöö meetod (20-30 üliõpilast rühmas, töö juhendi ja filmimaterjalidega) kombineeritud lähenemisega (lühike auditoorne sissejuhatus, millele järgnes töö vaheldumisi väikestes rühmades (7-8 õppijat) veebipõhiste õpimoodulitega ja juhendajaga laboratoorsed tööd). 2003. aastal lisati ka iseseisva töö osa enne laboratoorse töö sooritamist, kokkuvõtvad arutelud ja kaks korda nädalas toimuvad kohtumised. Nagu eelpool öeldud, muutis kombineeritud õppe kasutuselevõtt oluliselt õppijate oskust teoreetiliste teadmiste rakendamiseks.

Kokkuvõte

Käesolevas peatükis esitati rida kombineeritud õppe praktilise kasutamise ülevaateid Euroopa ülikoolide kontekstis. Kombineerimise võimalusi on väga palju – igal institutsioonil tuleb ise otsustada, milliste kriteeriumide põhjal ja milliseid komponente valides on võimalik saavutada efektiivseim õppeprotsess ja paranenud õpitulemused. Kombineeritud kursuse loomise puhul on esmatähtis leida õige tasakaal auditoorse ja tehnoloogiatel põhinevate õppemeetodite kasutamise osas. Kursuse ülesehitus tuleb üksikasjalikult läbi mõelda, sest kombineeritud õpe ei seisne vaid eri esitusvahendite ja -keskkondade kasutamises, vaid keskenduda tuleb ikkagi ennekõike õpitulemusele. Õppija vaatepunkti unustamine kursuse koostamisel oleks kahetsusväärne. Õppimise kultuur, õppevahendid, elektroonilise infrastruktuuri kvaliteet, valitud lahenduste töökindlus ja mõõdetavus on mõned neist kriteeriumitest, mille-

le õppija seisukohalt (ja mitte ainult) tuleb tähelepanu pöörata.

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Akadeemilised uurimused ja kombineeritud õppe projektid

Sissejuhatus

Kombineeritud õpe on oma koha leidnud paljudes Euroopa uurimis- ja rakendusprojektides. Kombineeritud õpet defineeritakse neis mitmel eri moel, samuti on erisusi nähtuse sisu käsitlemise osas. Gyntheri (2005) väitel on kombineeritud õppe termin Ameerika päritolu ja tähistab auditoorse õppe ja tehnoloogiliselt vahendatud õppe ühendamist, kasutades eri pedagoogilisi meetodeid ja erinevaid tehnoloogiaid. Käesolevas peatükis on vaatluse all ainult projektid, milles tegeletakse otseselt kombineeritud õppega. Sarnase sisuga, ent erinevalt defineeritud tegevused on käesolevast uurimusest välja jäetud.

Vaatamata sellele, et kõikides vaatluse all olnud projektides kasutatakse kombineeritud õppe mõistet, on projektide sisu olemuselt või rõhuasetuselt ometi erinev ja seepärast oleme peatüki jaotanud nelja kategooriasse:

1. Projektid, kus tehnoloogiliste vahendite integreerimine tavaõppesse on projekti peamine eesmärk;
2. Projektid, mille põhisisuks on kombineeritud õppe tunnetuslik pool, kogemused suhtlemisvahendite kasutamisel ja sotsiaalsed suhted;
3. Projektid, milles tegeletakse eri didaktiliste meetodite kasutamise mõjudega; ja
4. Projektid, mille uurimisobjektiks on kombineeritud õppe kasutamise mõjud organisatsioonile.

Projekte, milles kombineeritud õppega tegeletakse, on üsna suur hulk ja kõikidele ei ole kahjuks võimalik piisavalt tähelepanu pöörata. Käesolevast peatükist välja jäänud projektidega on võimalik tutvuda kogumiku inglisekeelses versioonis (Appendix).

Akadeemilised uurimused ja tehnoloogiliste vahendite integreerimise/standardiseerimise projektid

Tehnoloogiliste vahendite kaasamisega õppetöösse on seotud mitmeid projekte. Ja vaatamata sellele, et kombineeritud õpet võib pidada juba pikka aega kasutusel olnud nähtuseks, on selle rakendamisega akadeemilises õppes hakatud tõsisemalt tegelema alles viimasel ajal.
Kennedy (2005) toob välja, et seoses kiirete arengutega kombineeritud õppe rakendamisel on aeg ka kvaliteedistandardite väljatöötamiseks. Kahjuks on kehtestatud standardid sageli otseselt üle võetud traditsioonilise auditoorse õppe hindamissüsteemidest ja seetõttu ei vasta adekvaatselt veebipõhise õppe erisustele. Kennedy uurimuses tegeleti standardite kehtestamisega veebipõhises õppetöös õendusteaduse valdkonnas. Ta toob välja mitmed puudused just kasutatavate eeskujude osas. Standardite-alane kompetents võiks küll olla kõrgharidusele ülekantav meditsiinist, aga peamine tugi tuli õpetajatele mitte haridussektorist, vaid tehnoloogiasektorist, eriti IT-valdkonnast. Õendusteaduse osakond Paisley Ülikoolis, Šotimaal, kasutas veebipõhise õppe standardite väljatöötamisel just IT-valdkonnast saadud teadmisi. IT-standardite rakendamise tulemusena lihtsustus oluliselt ka tehnoloogiliste vahendite integreerimist õppetöösse.

Christensen on oma artiklis (2003) kirjeldanud Brigham Young University's (Utah) läbi viidud projekti, mis tegeles haridustehnoloogilise algõppe läbiviimisega. Peamiseks edu kriteeriumiks peab autor auditoorse ja veebipõhise õppe õigesti valitud vahekordi. Õppejõu jaoks lihtsustab selliste valikute tegelemist just kindlate standardite olemasolu.

Voogti uurimisrühm on rakendanud ja hinnanud õppejõu professionaalse arengu lähenemist kahes eri projektis. Autorid tõdevad, et tehnoloogia juurutamist õppetöös peetakse üldjuhul kompleksseks ja keeruliseks innovatsioonitegevuseks. Peamiseks probleemiks on seejuures õppejõudude vastavate oskuste puudumine. Tulemuseks on tehnoloogiliste võimaluste tegeliku potentsiaali kasutamata jätmine. Voogt uurib ka gümnaasiumiõpetajatele suunatud kombineeritud õpet, mille eesmärgiks oli õpetajate toetami-

ne nende endi kombineeritud õppetöö väljatöötamisel. Kursus koosnes õpitubadest, õppekavade näidistekstidest ja veebipõhisest suhtluskeskkonnast. Mõlema uurigu puhul toodi välja, et just õigete proportsioonide leidmine tundus olevat oluliseks eduteguriks kombineeritud õppe rakendamisel. Samas osutus suhtluskogukondade loomine keeruliseks, kuna enamiku õpetajate jaoks ei ole tehnoloogiliste vahendite kasutamine igapäevane tegevus.

Sarnase probleemiga on tegelenud ka Bjarno juhitud uurimisprojekt Oslo Ülikoolis. Projekti peamiseks eesmärgiks oli IKT-vahendite integreerimine õpetajakoolituse erialamoodulitesse. Õpetajakoolituse üliõpilaste probleemiks oli vähene oskus oma igapäevatöös tehnoloogilisi vahendeid kasutada. Õppijate IKT-alased oskused olid piisavad, puudus aga reaalse rakendamise kogemus. Oslo Ülikooli IT-osakonna initsiatiivil asendati IKT-alaste oskuste kursused nö kombineeritud õppetööga, kus erialakursuste üheks osaks sai töö tehnoloogiliste vahenditega. Projekti tulemusena paranes oluliselt (21%) õppijate hinnang kursusele võrreldes eelmise korraldusega. Projekti läbiviijad soovitavad ka teistele kõrgharidusasutustele IKT vahendite kasutamise alast õpet korraldada erialaainete osana.

Motterami juhitud projekt (2006) keskendus tasakaalustatud kombinatsioonide analüüsile kõrghariduspedagoogikas. Projekt tugines Manchesteri Ülikooli õpetajakoolituse magistriõppekavas kombineeritud õppe rakendamisele. Motterami hinnangul on oluline leida tasakaalustatud vahekord auditoorse ja veebipõhise õppetöökorralduse vahel. Õige meetodite valik tagab õppija oskuste arengu ja võimaldab ära kasutada nii eelnevaid kogemusi kui kasutada kursusel saadud kogemusi edaspidises praktilises tegevuses. Just osalejate eelneva kogemuse toel oli kombineeritud kursustel võimalik saavutada tehnoloogiliste abivahendite suur kasutegur.

Kõik eelpoolkirjeldatud projektid näitavad ilmekalt, kuidas kombineeritud õppe kasutamine parandab oluliselt õppija oskusi tehnoloogilisi vahendeid ka enda igapäevatöös kasutada. Mitmete projektide puhul on põhisõnumiks tehnoloogia lülitamine erialakursustesse, selle asemel et õpetada tehnoloogiliste vahendite kasutamist eraldiseisva programmi alusel. Kombineeritud õpet võib seega pidada abivahendiks IKT kasutamise oskuse omandamiseks ilma selleks eraldi koolitust läbimata.

Sotsiaalsete võrgustikega tegelevad akadeemilised uurimused ja projektid

Tehnoloogiliste vahendite õppetöösse integreerimise teema on otseselt seotud ka osalejate ootuste ja tajuga. Ka sel teemal on läbi viidud mitmeid erinevaid uurimisprojekte. Üheks selliseks on Rogersi uurimisgrupi töö (2003) õppijatega toimuvate arengute ja muutuste uurimiseks. Projekt viidi läbi Brigham Young Ülikoolis (Utah, USA) ja uurimisobjektiks oli kombineeritud õppe kasutamine kaugõppe ja auditoorse õppe integreerimisel sünkroonseks kursuseks. Uurimus keskendus küsimusele, kuidas tunnetavad eri viisil õppivad tudengid (kaugõppe vormis, päevases õppes) kombineeritud õppe efektiivsust.

Ruizi juhitud projektis (2006) tegeleti e-õppe rakendamise uurimisega õppija eesmärkidest lähtuvalt. Autorid väidavad, et e-õppe metoodika rakendamine annab õppijale võimaluse ise osaleda oma õpiprotsessi ja –tulemuste kujundamises ning seega saavutada ka ootustele paremini vastav lõpptulemus. Projektis osalesid arstiõppe tudengid, kelle hinnangul e-õppe vahendid kokkuvõttes ei tähistanud pelgalt ühte eraldiseisvat osa õppetööst, vaid moodustasid koos auditoorse õppega ühtse terviku. Autorid leiavad, et innovatsioon e-õppe tehnoloogiates tähistab ennekõike õppija võimaluste suurenemist individualiseeritud õppe saavutamiseks. Lisaks loob kombineeritud õppe kasutamine õppijate jaoks märksa laialdasemad võimalused omavaheliseks suhtlemiseks ja koostöös õppimiseks. Teiseneb ka õpetaja roll kõrghariduses.

Kirjeldatud sotsiaalsetele aspektidele viitavad ka Aspden ja Helm (2004), kelle projekt keskendus päevase õppe üliõpilaste osalemisele virtuaalses õppes. Projekti lõpptulemuste esitamisel tõdetakse, et veebipõhine õpe muudab õppija ja õpetaja vahekordi ja suhteid ka päevase õppe (*on-campus*) puhul. Autorid väidavad, et pigem on e-õppe vahendite integreerimise eesmärgiks paranenud suhtlemine õppija ja õppejõu vahel ja mitte niivõrd kõrgkooli soov asendada auditoorne õppe kaugõppega. Projekti raames anti üksikasjalik ülevaade sellest, kuidas ka päevase õppe üliõpilasel on võimalik tehnoloogiliste vahendite kasutamise tulemusena saavutada parem kontakt oma kaasüliõpilaste ja õppejõududega. Kvalitatiivse tulemuste andmestiku põhjal toovad autorid välja tingimused, kuidas tehnoloogiate kasutamine võib parandada õpperühmade omavahelist suhtlemist (isegi kui veebipõhine suhtlemine ei toimu reaalajas) ning kuidas virtuaalse ja füüsilise kohalolekuga õppimise segamine võib luua paranenud õpitulemusi.

Suhtlemise ja sotsiaalsete kogukondade mõjuga õpitulemustele tegeleb ka Gary Motteram (2006). Kombineeritud õppe kasutamise uurimisprojektiga Manchesteri Ülikooli õpetajakoolituse magistriõppeprogrammis püüdsid läbiviijad välja selgitada tudengitevahelise kogemustevahetamise ulatust ja tulemusi sotsiaalsete võrgustike ja praktikakogukondade kaasabil. Eelnevad kogemused mängisid üldjuhul olulist rolli ja aitasid kaasa haridustehnoloogiliste vahendite kasutamisest reaalse kasu saamisel.

Veel üks projekt, mille eesmärgiks oli õppijate omavahelise suhtlemise tulemusel saavutatud positiivsete õpitulemuste kaardistamine, viidi läbi Guldbergi ja Pilkingtoni poolt (2006).
Guldberg ja Pilkington (2006) analüüsisid täiskasvanud õppijate arengut veebipõhises õpikogukonnas. Analüüsi aluseks oli valik veebipõhiste diskussioonide näiteid. Uurimistulemused kirjeldasid erineva kogemusega õppijate (näiteks lapsevanemad, autistlike häiretega isikute tugiisikud, jne) koostööoskusi ja võimet luua ühiseid seisukohti. Täiskasvanud õppijate laialdased kogemused toetasid õppija koostöövõimet kursuse raames. Diskusioonirühmade käigus tugevnes grupiidentiteet ja keerulisemate ülesannete lahendamine ei olnud õppijate jaoks keeruline.

Vastupidiselt mitmete eelpoolkirjeldatud projektide tulemusele (Aspden ja Helm 2004, Guldberg ja Pilkington 2006), leiavad Welkeri ja Berardino oma *State University of New York Institute of Technology* tudengite seas läbi viidud uurimisprojektis (2005), et kombineeritud õppe kasutuselevõtuga kaasneb ka vähenenud sotsiaalne aktiivsus ja õppetöö selgus ning teiselt poolt suurenenud töömaht. Tulemused ei ole siiski täiesti negatiivsed, kuivõrd õppijad märkisid ka kombineeritud õppe positiivseid kaasnähte, nagu näiteks õppetöö suurenenud paindlikkust, iseseisvuse ja sobivamate õppevormide valikuvõimaluste suurenemist, aga ka majanduslikke eeliseid (sama õppemaksu juures oli võimalik aja ja reisimise kuludelt kokku hoida).

Kogukondade loomise ja suhtlemise parandamise küsimused õppetöö kvaliteeditõstmise teguritena on pedagoogikaalaseid uurimusi huvitanud juba pikki aastaid. Tehnoloogiate roll nende küsimuste lahendamisel on olnud ennekõike arvutipõhise ühisõppe valdkonna uurimisobjektiks.

Didaktiliste lahenduste ja õpistrateegiatega tegelevad akadeemilised uurimused ja projektid

Didaktiline aspekt käib alati mistahes õppetöö uuringute juurde. Ka kombineeritud õppe temaatika puhul on päevakorral didaktiliste valikute ja õpistrateegiate küsimused.

Suncana Kukolja Taradi juhitud uurimuses (2005) oli vaatluse all teise aasta üliõpilastele mõeldud valikaine „Happe-alus tasakaalu füsioloogia". Kursuse jaoks loodud rikkalik, õppijakeskne veebikeskkond (WebCT keskkonnas) pidi eeldatavalt tagama eduka probleemõppe tugisüsteemi. Kursuse eesmärgiks oli õppijate töötamine väikestes koostöörühmades probleemõppe meetodite abil.

Taradi uurimuse eesmärgiks oli välja selgitada kombineeritud veebipõhise probleemõppe mõju õpitulemustele. Õppijate testitulemusi ja rahuloluuuringute tulemusi võrreldi kombineeritud õppe vormis toimunud kursuse ja samasisulise kursuse auditoorse vormi vahel. Kombineeritud õpet kasutanud tudengid saavutasid lõppeksamil märgatavalt paremaid tulemusi ning samuti väljendus nende positiivne hinnang kursusele rahuloluküsimustikes. Erinevus kahe grupi tulemuste vahel oli koguni 76%, mis statistiliselt vastab keskmisele mõjule. Seega võib järeldada, et tehnoloogiliste vahendite kasutamine õppetöös mõjutas positiivselt nii õppijate õpitulemusi kui ka rahuolu õppetöö läbiviimisega.

Jeanine Romano keskendub oma artiklis (2005) kaugõppe ja kombineeritud õppe õpistrateegiate analüüsile. Uurimuse autorid mõõtsid ja võrdlesid meeldejätmise (inglise keeles *cramming*) ja pikemaajalise materjalidega töötamise (inglise keeles *spaced-review*) käitumist üliõpilaste õpitulemuste ja hoiakutega kogu õppetsükli vältel. Ehkki teoreetiliselt peaks eeldama, et pikemajalise materjalidega töötamise tulemuslikkus võrreldes viimasel hetkel mehhaanilise „tuupimisega" peaks tagama parema õpitulemuse, avastasid uurijad projekti tulemustes mõlemapidiseid nähte. 157 kaugõppe ja kombineeritud õppe üliõpilast jagati viide gruppi vastavalt nende õpistiilile (*cramming/spaced-review*). Õpistiilidest tulenevaid erinevusi oli võimalik välja tuua nii eri edastusviiside puhul (kaugõpe vs kombineeritud õpe) kui ka saavutuste ja suhtumiste tasandil.

Nuckles et al. (2004) uurimisprojekt keskendus samuti õpistrateegiatele. Vaatluse alla võeti õpipäevikute kasutamine ja uurimuse eesmärgiks välja selgitada õppijate arvamus õpikogemuse ja –tulemuste kohta. Uurimuses osalesid kõrgkooli kursuse seminarides osalejad. Päevikute täitmist juhendati arvutiprogrammi eHELp abil. eHELp on loodud eesmärgiga toetada teaduslike õpipäevikute täitmist vastavate mudelite ja raamistiku pakkumisega õppetöö planeerimisel, materjalide loomisel ja õpitulemuste hindamisel. Lisaks pidid õppijad oma päevikud ka avalikustama teistele rühmakaaslastele ja arutama kirjapandut rühma liikmetega. Uurimisprojekti tulemused viitavad sügava õppimisprotsessi ja parema materjali omandamise tekkimisele tänu veebipõhiste päevikute kasutuselevõtule. Selle tulemuse saavutamise põhilised determineerijad olid õppija jaoks kombineeritud õppe vormiga kaasnenud huvipakkuvam õppeprotsess, parem kursuse ülesehitus, kriitilise mõtlemise arendamine ja metakognitiivsed tegevused.

Järgmine projekt (Yeh et al. 2005) tegeles õpitulemuste muutuste analüüsiga seoses õppijate tegevuste salvestamise meetodi kasutuselevõtuga. Õppetöö salvestused sisaldasid veebipõhiste üleannete hindamistulemusi, materjalide lugemiseks kulutatud aega, keskkonda sisenemise arvu ja veebipõhistes diskussioonides osalemise arvu. Õpitulemuse hindamiseks kasutati kahte vaheeksamit ja ühte lõpueksamit. Kõik õppijate tegevuste salvestused loodi automatiseeritult. Läbiviidud katse näitas, et oluline erinevus õpitulemustes tekkis 100% e-õppe vormis ja kombineeritud õppes õppinud tudengite tulemustes. Samas oli mõlemal juhul peamiseks õpitulemuste positiivsust mõjutavaks teguriks kodutööde kvaliteet.

Gynther (2005) kirjeldab olukorda Taani e-õppes ja väidab, et enamik e-õppega tegelevatest koolitusasutusest Taanis kasutab veebipõhiseid tegevusi peamiselt praktikakogukondade toetamiseks ja informaalse suhtlemise läbiviimiseks. Holbaeki Hariduskolledžis viidi koostöös tudengitega läbi uurimisprojekt uuenduslike didaktiliste meetodite arendamiseks, testimiseks ja rakendamiseks. Uuriti järgmisi küsimusi:

1. Missugune on teadmine, mida õppija vajab ja mis laadi pedagoogilisi vahendeid on selle saavutamiseks vaja?
2. Kuidas korraldada õppija „ruum"?
3. Kuidas luua õppimiseks vajalik õhustik (learning milieu)?
4. Millised vahendid on vajalikud õppejõu eelpoolkirjeldatud valikute toetamiseks?

Õppijate grupp koostati inimestest, kellel tavatingimustes puudub võimalus päevases auditoorses õppes osalemiseks. Õppijate tagasiside kursusega kaasnenud paindlikkuse kohta oli väga positiivne. Suhtlemiseks ja materjalide edastamiseks kasutati veebipõhise konverentsi formaati. Õppijate lõpptulemuste põhjal saab väita, et kombineeritud metoodikaga kursusel osalenute õpitulemused olid paremad samasisulises auditoorses õppes osalenute tulemustest.

Gynther leiab ka, et õppija aktiveerimiseks on vajalikud mõnede spetsiifiliste protseduuride kasutamine: Osalemisvõimaluste tagamine, Tähenduste loomine, Vastastikuse suhestumise tagamine, Ühise eesmärgi loomine; Teadmiste vahetamise õhutamine.

Õppimise organisatsiooniga tegelevad akadeemilised uurimused ja projektid

Kombineeritud õppe juurutamine kõrgkoolides on otseselt seotud ka organisatsiooniliste küsimustega. Boeker ja Klar (2006) väidavad, et tehnoloogilistest lahendustest enam määravad e-õppe tulemuslikkust didaktilised ja organisatsioonilised valikud. Arstiteaduse õppekava läbiviimise analüüsile toetudes näitasid autorid, kuidas e-õppe juurutamine on korraldatud eri viisidel: lineaarselt, hüperteksti vormis, multimeedia presentatsioonidena, juhendamissüsteemide ja simulatsioonide kasutamise abil. Meditsiinis on juhtumipõhise õppe kasutamine väga oluline, kuivõrd see meetod võimaldab arstitudengeil saada praktilise töö kogemust simuleeritud keskkonnas. E-õppe pikaajalise positiivse tulemuse saavutamiseks on oluline, et see oleks oskuslikult integreeritud ülejäänud õppeprogrammiga. Juhtumipõhise õppe puhul on võimalik efektiivselt kasutada auditoorse ja e-õppe komponente. Konkreetse projekti puhul kasutati ära õpihalduskeskkonna võimalusi kursuse sisu organiseerimiseks ja esitamiseks. Samuti tagas õpihalduskeskkonna kasutamine head võimalused rühmasiseseks suhtlemiseks, interaktiivsete komponentide kasutamises, kursuse organiseerimiseks ja rolli-põhiseks suhtlemiseks. Projekti läbiviijad tõdesid, et e-õppe eduka juurutamise tagamiseks on vajalik eelnev nõuete ja kasutajate analüüs, ülejäänud organisatsiooniga sobitumine, õppekava integreerimine ja pidev suhtlemine õppijaga.

Veel üks e-õppe juurutamisega kaasnev organisatsiooniline efekt ja ka organisatsiooni positiivset arengut toetav tegur on võimalus kaasata rohkem õppijaid ja vähendada õppetööga seotud personali ajakulu. Cottrell ja Robison (2003) kirjeldavad suure osalejate arvuga Raamatupidamise kursust Brigham Young Ülikoolis (Utah, USA), kus kombineeritud õppe kasutuselevõtu eesmärkideks oli mh õppejõudude ajakulu vähendamine, õppijate ajakasutuse ümberfokusseerimine, osalemise tagamine rohkematele õppijatele.

Kombineeritud õppe organisatsioonilise poolega tegeleb ka Welkeri ja Berardino uurimisprojekt (2005). Welker ja Berardino uurisid kombineeritud õppe kasutamist State University of New Yorki Tehnoloogiainstituudis ja leidsid, et kombineeritud õppe juurutamise tulemusena suurenes õppijate osalus kursusel, arenesid õpitulemused, paranesid kirjutamis- ja diskussioonioskused.

Õpihaldustehnoloogia ja soovitused kursuste disainimiseks olid tagatud organisatsiooni poolt. Projekti tulemused näitasid, et ehkki väljapakutud abivahendeid oli lihtne kasutada, suurenes ometi õppejõudude ajakulu õppetöö läbiviimisele, samuti kannatas õppetöö sujuvus.

Organisatsioonilisi muutusi võib kombineeritud õpe kaasa tuua ka tudengite paiknemise ja aja/ruumi dimensioonide mõistes. Asjakohane näide pärineb Austraaliast, kus viimasel ajal on märgatav välistudengite osakaalu suurenemine õppijate hulgas. Mitmed uurimused näitavad, et erineva kultuuritaustaga õppijate jaoks on eri õpikeskkondadel erinev mõju. Lanham and Zhou (2003) seletavad üldist õpistiilide muutumist just suurenenud välistudengite arvuga. Tänu muutunud õppijate kontingendile on vajalik ka muudatused organisatsioonilistes korraldustes ja õppimise paindlikkuses. Autorid leiavad, kõikide õppijate positiivse osaluse

tagamiseks on vajalik eeltöö kultuuriliste erisustega toimetulekuks.

Kokkuvõte

Kombineeritud õppe uurimisvaldkond on olemuselt mitmekesine ja tegeleb väga erinevate õppimise ja õpikeskkondade aspektidega. Käesolevas peatükis anti lühike ülevaade erinevatest kombineeritud õppe juurutamisega kaasnevatest sõlmpunktidest ja kirjeldati mõnesid näiteid väljatoodud aspektide illustreerimiseks.

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Näiteid kombineeritud õppe kasutamisest erasektori koolituses

Sissejuhatus

Ehkki B-Learn projekt keskendus just traditsiooniliste ülikoolide õppepraktikale, vaatleme siinkohal lühidalt ka erasektori koolituses kasutatavaid mõisteid ja praktilisi võtteid. Loodame, et lugeja jaoks leidub ka selles valdkonnas kasulikke ja järeleproovimist väärt näiteid.

Kombineeritud õppe mudelid erasektori koolituses

Mitmete eelmistes peatükkides viidatud autorite jaoks on kombineeritud õpe paljuski õppetöö hindamsie vahendiks. Samas on rida autoreid, kelle jaoks kombineeritud õppe puhul on esmatähtsad just reaalsed kasutamisvõimalused koolitustegevuses. Erasektori koolituste puhul leiab kombineeritud õppe mõiste kasutamist peamiselt ühes selgepiirilises tähenduses – auditoorse ja tehnoloogiliselt vahendatud õppetöö kombinatsioon.

Kaye Thorne'i (2003) (käsi)raamatute sihtrühmaks on ennekõike kommertskoolitusi ja firmasiseseid ametialaseid (täiendus) koolitusi pakkuvad firmad. Thorne soovitab kombineeritud õpet kasutada õppetöö paremate individualiseerimisvõimaluste pärast. Thorne viitab Howard Gardneri multiintelligentsuse teooriale ja inimeste erinevustele õpistiimulitele reageerimisel. Kombineeritud õppe kasutamine annab koolitajatele võimaluse pakkuda oma klientidele just konkreetsele isikule sobivaid töötamise viise ja sellega keskenduda konkreetsele õpivajadusele. Kombineeritud õppe kasutuselevõtt vähendab üldiste, „kõigile midagi" tüüpi koolitustega kaasnevat rahulolematust. Thorne pakub välja seitse sammu kombineeritud koolituse planeerimiseks:

1. Nõudluse ja ajaliste võimaluste arvestamine. Kombineeritud õppe võtmesõna on paindlikkus.
2. Erinevate õpistiilide tunnistamine. Iga õppija eelistab teatud õppimise stiile ja vahendeid.
3. Parima kombinatsiooni loomine. Igale õpetamise meetodile vastab üldjuhul ka just selle meetodi jaoks sobivaim õppevorm. Tehnoloogiliste vahendite kaasamine õppetöösse loob õppijale valikuvõimaluse ja eeldatavasti ka parema õpitulemuse.
4. Õpiobjektid sünnivad koostöös. Koolituse pakkuja eesmärgiks peab olema konkreetsele nõudlusele vastavate parimate õpetajate ja sobivaimate tehnoloogiliste lahenduste leidmine.
5. Õppijasõbraliku õppeprotsessi koostamine.
6. Ettevalmistus võimaliku koolitusejärgse nõustamise pakkumiseks õppijatele.
7. Monitooringusüsteemi loomine koolituse efektiivsuse hindamiseks.

Samuti näeb Thorne eri meediumite kombineerimisel järgmisi eeliseid:

- Ülejäänud rühm ei pea ootama mahajääjate järel.
- Kõigil on võimalik valida sobiv kiirus kursuse läbimiseks.
- Alati on võimalik kursuse materjalidele lisaks viidata Internetis kättesaadavatele lisamaterjalidele.
- Elektrooniliste meediumite kasutamine võimaldab lihtsat infolevitamist kõigile huvilistele. 35
- Osalejatele saab pakkuda kasutamiseks märksa suuremat materjalide mahtu kui auditoorse õppe puhul.
- Ühelt loengult puudumine ei tarvitse tähendada tõsist lünka õppimises.
- Kokku hoitakse aega ja reisikulusid.
- Võimalus virtuaalsete meeskondade loomiseks, inimeste geograafiline paiknemine ei ole enam oluline.
- Õppematerjalidega on võimalik tutvuda enne auditoorsete tegevuste toimumist ja seega on klassiruumis võimalik rohkem

pühenduda praktilisele tegevusele.
- Individuaalsete koolituste loomise võimalus.
- Õpetaja ajakulu kokkuhoiust sünnib ka koolituse üldine kulude kokkuhoid.
- Õppimine muutub õppija jaoks sihtotstarbelisemaks, fokusseeritumaks, ajastatumaks.
- Laienevad suhtlemisvõimalused õppijate vahel ja juhendajatega.

Kommertskoolituste „kombineerimisele" on palju tähelepanu pühendanud ka Josh Bersin. (2004). Bersin viitab asjaolule, et reaalselt on organisatsioonid püüdnud arvutite abi koolituses ära kasutada juba alates nende turuleilmumisest 1960. aastatel, teiste seas on välja arendatud koolitussüsteemid nagu Plato (autor *Control Data*, Illinois' Ülikool). Plato oli üks arvutite kasutuselevõtu pioneere haridusasutustes ja see süsteem eksisteerib reaalselt tänapäevani.

Bersin kirjeldab kahte peamist kombineeritud õppe rakendamise printsiipi:

1. *"Sujuva õppeprogrammi" mudel: üksikasjalikult planeeritud kursus, milles on integreeritud erinevad meediumid ja lõpptulemuseks on kronoloogilises järgnevuses õppeprogramm või kursus. Kursuse koostisosad on ülesehitatud järgnevuse põhimõttel, iga järgmise mooduli eelduseks on eelmiste läbimine. Kursus lõpeb üldise õpitulemuse mõõtmiseks korraldatud eksami vm tulemuste hindamiseks tegevusega. See mudel on võrreldav tavapärase kõrgkoolikursusega.*

See koolitusmudel tagab õppija kindla seotuse kursusega ja võimalikult suure lõpetajate protsendi. Õppija on kursusega tugevamalt seotud ja saab oma tegevused pika aja peale ette planeerida. Bersin väidab, et selle mudeli kasutamisel on õppijal võimalik kõik õppetööga seotud tegevused ette planeerida ja samal ajal tagab pidev seotus ka kursuse lõpetamiseni jõudmise. Selle mudeli kasutamisel on õppejõul võimalik pidevalt jälgida õppija edasijõudmist ja õigeaegselt märgata iga üksiku osaleja probleeme ja tagasilööke. Bersini hinnangul on selle mudeli kasutamine õigustatud eelkõige traditsioonilise õppe puhul. See mudel sobib enamike õpetamise paradigmadega („õpi/proovi/hinda"). Selle mudeli tulemused on kergesti hinnatavad, seda on lihtne täiendada ja läbi viia.

2. *"Telje-ja-kodarate" mudel: üks keskne koolitus (auditoorne õppetöö või veebipõhine õppematerjal), mida toetavad lisamaterjalid, tegevused, suhtluskeskkonnad jm lisategevused, mis võivad olla nii kohustuslikud kui vabatahtlikud, ent mille põhieesmärk on keskse koolituse toetamine.*

See koolitusmudel on loodud pigem üksiku koolituskursuse jaoks, mille puhul kasutatakse ühte keskset meediumi (elektroonilist või auditoorset) ning muud vahendid ja tegevused on lisamaterjali staatuses. Peamine erinevus „Sujuva õppeprogrammi" mudeliga võrreldes seisneb lisamaterjalide kasutamise vabatahtlikkuses. Õppijal on võimalik ise otsustada, millist lisamaterjali kasutada ja kõik õppijad ei ole kohustatud läbi kursust samaaegselt. Selle mudeli kasutamisel on lihtsam tegeleda kursuse pideva edasiarendusega.

Alustuseks on lihtne välja töötada kursuse keskne programm ja materjalid ning seejärel etapiviisiliselt korraldada lisamaterjalide liitmine kursusele. Selline lähenemine eeldab õppijalt suuremat motiveeritust ja iseseisvust. Mudeli eeliseks on võimalus pidavaks arendustegevuseks – koolitajal on alati olemas võimalus kursuse täiendamiseks ja edasiarendamiseks (nt materjalide lisamiseks). Telje-ja-kodarate mudeli kasutamine on õigustatud just õppija individuaalsete vajadustega arvestava koolituse loomisel. Samas eeldab selline lähenemine õppijalt suuremat motiveeritust ja oskust eri meediumite ja õppematerjalide seast valikuid teha.

Kuidas otsustada, kumba mudelit peaks eelistama? Bersin pakub välja nimekirja kaheksast valikukriteeriumist:

Programmi tüüp: Valida toetudes majanduslikele kaalutlustele;
Sotsiaalsed eesmärgid: Suhete, sidemete ja jagatud väärtuste loomine;
Auditoorium: Rühma suurus, oskuste tase, motivatsioon, ajalised võimalused;
Eelarve: Palju maksab kursuse väljaarendamine;
Ressursid: Aeg, raha ja inimesed;
Kursuse sisu: Komplekssuse astme ja interaktiivsete võimaluste arvestamine;
Tehnoloogiad: Standardid, osalejate võimalused, turvalisuskaalutlused;
Mis mõjutab kulutusi: Osalejate arv;
Vahendite valik: Ise tegemine vs sisseostmine.

Esitlusvahendite valikul soovitab Bersin jälgida järgmisi kriteeriumeid:

Mudel	**Olulisemad tegurid**
Veebipõhine iseseisev õpe kombineeritud lisamaterjalidega	Õppija iseseisev töö on kursuse keskne tegur. Õppijal on võimalik kasutada erinevaid toetavaid materjale (telje-ja-kodara mudel)
Koolitaja poolt juhitud õppeprotsess kombinatsioonis veebipõhise iseseisva e-õppega	e-õppe kasutamine nii loengutes kui loengutevahelisel ajal
Sünkroonne e-õpe lisamaterjalidega	Õpihaldussüsteemid, e-õppe meetodid, iseseisev töö
Koolitus töökohal	Töökohal toimuv koolitus juhendaja osalemisel
Simulatsioon ja laboratoorne töö	IT vahendite keskne koolitus, kus kogu keskkond võib olla simulatsiooni vormis

(Bersin 2004: 85)

Seda mudelit võib rakendada nii ärikoolituse kui ka traditsioonilise akadeemilise õppe puhul. Bersin on oma mudelite näitlikustamiseks esitanud ka neli erinevat erasektori koolituse näidet:

Tüüp 1: Informatsiooni edastamine.
Kasutatavad e-õppe ja koolituse tegevused: Loe, kuula, vaata.
Kasutatavad tehnoloogiad: Video/audiokonverentsid, veebipõhised seminarid, e-kirjad, infokirjad.

Tüüp 2: Oluliste oskuste omandamine.
Kasutatavad e-õppe ja koolituse tegevused: Loe, kuula, vaata ja küsi/vasta küsimustele.
Kasutatavad tehnoloogiad: PowerPointi-põhised materjalid, sünkroonne veebipõhine seminar, saavutuste jälgimine aga mitte hindamine.

Tüüp 3: Oskused ja kompetentsid.
Kasutatavad e-õppe ja koolituse tegevused: Loe, kuula, suhtle, harjuta, küsi, suhtle teiste osalejatega, soorita lõpueksam, mõtesta tagasiside.
Kasutatavad tehnoloogiad: Veebipõhised materjalid, auditoorne õpe, audio/videokonverentsid, laboratoorsed tööd, simulatsioonid.

Tüüp 4: Sertifitseerimine (Tulemuste- või standarditepõhiselt)
Kasutatavad e-õppe ja koolituse tegevused: Loe, kuula, suhtle, harjuta, vasta küsimustele, soorita eksam, mõtesta tagasiside.
Kasutatavad tehnoloogiad: Veebipõhised materjalid, auditoorne õpe, audio/videokonverentsid, laboratoorsed tööd, simulatsioonid, testimine, soorituse jälgimine.

Bersin rõhutab, et üks kombineeritud koolituse olulisemaid tegureid on soorituse jälgimise ja tagasisidestamise määra üle otsustamine. Jälgimise all peetakse siinkohal silmas automatiseeritud tegevusi osaluse, aktiivsuse, saavutuste ja rahuolu mõõtmiseks ja hindamiseks. Selliste tegevuste ulatuse üle peaks üldjuhul otsustama koolituse tellija. Kogemus on näidanud, et näiteks ei pühenda osalejad iseseisvate ülesannete täitmisele rohkem kui 1-2 tundi nädalas, v.a kui see on neile kursuse nõuetega kohustuslikuks tehtud.

Bersini soovitus mistahes ettevõttele on – kui ettevõttes on üles kerkinud tööjõualane probleem, aga samas on olemas ka potentsiaalsed lahendused ja rahalised ressursid, siis on vajalik ainult vastava õppeprogrammi väljatöötamine. Valida tuleb kohased vahendid, õiged osalejad ja piisavad rahalised kulutused.

Kommertskoolitustes e-vahendite kasutamisega on oma kirjutistes palju tegelenud ka Semler (2001) ja Troha (2002). Semler leiab, et kombineerides veebipõhiseid ja auditoorseid võtteid, on võimalik saavutada koolituse läbimise lühem aeg ja õppijate väiksem piiratus. Autor soovitab rea lihtsaid tehnikaid tavapärase auditoorse koolituse kombineeritud kursuseks edasiarendamiseks.

Siinkohal on loetletud kolm olulisemat selle tegevuse eesmärgipüstitust:

1) Suurenda õppimise efektiivsust;
2) Suurenda õppijate rahulolu ja kasutajamugavust;
3) Vähenda koolituse kulusid.

Keskendudes auditoorse töö osakaalu „parajale" mahule, on võimalik saavutada optimaalne õpitulemus. Õppijate mobiilsuse ja oma aja kontrollimise võimaldamine aitavad samuti kaasa parema õpitulemuse saavutamisele. Veebipõhise iseseisva õppetöö lülitamine koolituse programmi tagab lisaks õppija rahulolule ka kursuse kulude optimeerimise.

Troha pakub välja ka oma õpidisaini mudeli kombineeritud koolituse ettevalmistamiseks. Selles mudelis sisalduvate kontrollimehhanismide toel on võimalik tagada koolituse positiivne lõpptulemus. Mudeliga käib kaasas ka õpidisaini dokument, mis toetab kõikide osapoolte osalemist (nii läbijad kui läbiviijad). Mudel koosneb järgnevatest koostisosadest: Kursuse pealkiri, Eesmärk, Sihtgrupi kirjeldus, Kestus, Eeltingimused, Õpieesmärgid, Piirangud, Sisu/ Õppetegevuste kirjeldus, Õpistrateegia ja Hindamisstrateegia.

Näiteid kombineeritud õppest erasfääri koolituses

Eraettevõtete kombineeritud koolitust käsitlevad raamatud pühendavad palju tähelepanu ka positiivsete näidete eksponeerimisele. Järgnevalt kirjeldame mõnesid neist.

Kombineeritud õpe on väga levinud Ameerika erakoolitusfirmades, Euroopas aga oluliselt vähem kasutust leidnud. Mitmed analüüsid kinnitavad, et tehnoloogiliste vahendite kasutamine on Euroopa koolitusfirmade – ja mitte ainult koolitusfirmade, vaid ka üldiselt erasfääri organisatsioonide arendustegevuses – tegevuspraktikas jätkuvalt suhteliselt tagasihoidlik. Kasutamisaktiivsus näitab küll kasvutendentsi, aga kiiret arengut tõenäoliselt oodata ei ole – selleks oleks vajalik ka organisatsioonide üldise valmisoleku kiire tõus tehnoloogiliste arengutega kaasaminekul.

Inimressursi arendamise eelduseks on tehnoloogilised lahedused, nagu näiteks:

1. Juhtimisportaalid;
2. Simulatsioonid kogemuslikuks, interaktiivseks õppimiseks;
3. Laiahaardeline õpisisu.

Mitmed kombineeritud õppe eestkõnelejad leiavad, et kuna tehnoloogilised võimalused muutuvad järjest kasutajasõbralikumaks ja lihtsamaks, leiavad need ka järjest tõhusamat kasutamist organisatsioonide arendustöös (Trondsen 2006). Brennan (2004) väidab, et e-õppe rakendamisel on praeguseks läbitud varaste rakendajate periood (*early adopters*) ja firmad on avastamas, et mida kauem nad tehnoloogilisi vahendeid kasutavad, seda rohkem nad neid kasutavad. Kulude kokkuhoiu kõrval on tegelikult oluline ikkagi ka koolituste sisuline arendamine ja seda nii organisatsiooni kui ka iga üksiku töötaja kasu seisukohalt.

Euroopa koolitusturul on ametiühingukoolitus kujunemas üheks komineeritud õppe teerajajaks. Enamik Euroopa ametiühingute liite ja ka erialaliidud on tehnoloogilised lahendused oma koolitustegevuses kergesti omaks võtnud ja tekkimas on ka tegus üksteiselt õppimise koostöö.

2004. aastal läbi viidud uuringus küsitleti kuut eri ametiühingukoolitusega seotud gruppi Itaalias, Saksamaal, Hollandis, Rootsis ja Suurbritannias ning ühe rahvusvahelise ametiühinguühenduse liikmeid. Küsitluse tulemused kirjeldavad ilmekalt ametiühingute erinevaid viise IKT-vahendite kaasamisel koolitustegevusse. Loetletud juhtumianalüüsid näitasid eri riikide prioriteetide ja kohaliku konteksti erinevusi. Nende erinevuste tagamaad puudutavad nii lahknevusi asutuste organisatsioonilises kontekstis, ametiühingukultuuris, riiklikes poliitilistes eripärades kui ka IKT vahendite rakendamise kogemuses (Creanor ja Walker 2005).

Bersin (2004) kirjeldab firma General Motors näidet. See kompanii keskendub oma firmasiseses müügikonsultantide koolitustegevuses oluliselt just video-põhisele juhendamisele.

CBT Committee (lennunduskompanii) on välja arendanud koolitusel osalemise, jälgimise, tagasiside ja „järjehoidjate" elektroonilise süsteemi. AICC standardeid kasutatakse praktiliselt kõikide õpihaldussüsteemide puhul SCORM (inglise keeles *Sharable content object reference model*) on aegamööda muutumas keskseks õpiobjektide standardiks.

Euroopa vaste SCORMile on IMS õpidisaini mudel, mille väljatöötamine on initsieeritud Hollandi
Valkenburg grupi poolt. See mudel keskendub standardiseeritud võimalustele õpitegevuste kirjeldamisel nii e-õppe kui auditoorse-

te tegevuste puhul. Kombineeritud lähenemise mittearvestamine on olnud just SCORM-standardi üks puudustest. IMS standardi üheks eeliseks on aga just kombineeritud õppe mudeli arvestamine (Koper ja Tattersall 2005).

Veel üks praktiline näide pärineb multinatsionaalse naftakompanii koolitusüksusest. Kompanii avastas, et uute töötajate kohanemisel ja väljaõpetamisel on kriitilise tähendusega just sotsialiseerimisprotsess. Mõne kuu pikkuse kombineeritud koolitusprogrammi puhul kasutati nii online kui auditoorset õppetööd struktureeritud kombinatsioonis. Koolitusel kasutati nii iseseisvat õpet, veebipõhiseid mooduleid, auditoorset loenguvormi, sünkroonset veebipõhist diskussiooni ning samuti veebipõhist hindamissüsteemi. Kuna firma töötajad asuvad maailma eri paigus, korraldati kursuse lõpus ka auditoorne sessioon, mis võimaldas veebipõhise kursuse käigus tekkinud sotsiaalseid sidemeid ja kogukonnatunnet oluliselt tugevdada. Bersin toob selle näite puhul välja just sotsiaalse võrgustiku loomise olulisuse (Bersin 2004).

Veel üks kombineeritud õppe näide pärineb suure kaubandusettevõtte koolitusest. Firma telefonimüügiesindajate koolitamiseks oli keeruline leida sobivat aega, kuivõrd töötajate ajaressurss oli piiratud. SAP-süsteemi koolituse läbiviimiseks korraldati veebipõhine kursus, mis kukkus aga läbi, kuna müügiesindajatel ei olnud aega kursusel aktiivselt osaleda. Kompanii seisis probleemi ees, kuna uue süsteemi juurutamine eeldas töötajatelt uusi oskusi. Probleemi lahendusena katsetati kombineeritud õppeprogrammi rakendamist. Töötajad osalesid regionaalsete koordinaatorite kaasabil ühistel audiokonverentsidel. Koordinaatorite ülesandeks oli osalejate koondamine ühise koolituse raamidesse ja ühtse kohaliku sotsiaalse konteksti tekitamine. Kohaliku tausta sissetoomine koolitusprogrammi tagas õpitulemuse mitmekordse paranemise võrreldes eelmiste täielikult e-õppes läbitud kursustega (Bersin 2004).

Järgnevalt kirjeldame valikut Bersini kirjeldatud sujuva õppeprogrammi ja telje-ja-kodarate mudelite rakendamisvõimalustest.

Sujuva õppeprogrammi mudel:

Näide 1:
Roche Pharmaceuticals koostas õppeprogrammi SAP tellimussüsteemi koolituseks. Koolituse läbiviimise järel oli üheks olulisemaks tõdemuseks, et protseduuride-alane koolitus on vähemalt sama oluline kui süsteemi toimimise enda koolitus. Kompanii pidas vajalikuks koolitusprogrammi veelkordse läbitöötamise ja auditoorse mooduli lisamise. Auditoorne moodul koosnes pildi- ja diagrammide esitlemisest, mis tagasid tegevuse protsessi mõistmise funktsionaalsest vaatenurgast. Alles pärast auditoorse komponendi lisamist saavutati koolituse piisav efektiivsus.

Näide 2:
Firma BT planeeris uue toote turule toomist ja selle jaoks kavandati ka koolituskursus töötajate instrueerimiseks. Koolitusprogrammi väljatöötamise järel tõdeti, et programmi läbimine võtab töötajatelt liiga palju aega. Järgnevalt koostati kombineeritud õppe kursus, mis sisaldas 2-tunnist koolitust, millele eelnesid ja järgnesid õppejõu juhitud konverentskõned; seejärel teine 2-tunnine e-õppe moodul ja kursuse lõpus toimunud auditoorne 1-päevane praktiline lõpusessioon. Tulemusena saavutati koolituse oluline ajakulu vähendamine.

Näide 3:
USA pank, millega liitub igal aastal 2400 uut töötajat, kasutas 6-nädalast uute töötajate koolituskursust. Kombineeritud õppe kasutuselevõtu eesmärgiks oli õppeperioodi lühendamine neljale nädalale. Koolituse eest vastutav üksus töötas välja rea veebipõhiseid erinevate stsenaariumitega koolitustsükleid – sh simulatsioonid, rollimängud, rühmadiskussioonid ja briifingusessioonid mänedžeriga. Programmi väljatöötamiseks kulus peaaegu aasta, aga selle tulemused olid suurepärased ja koolitajate hinnangul

saavutasid õppijad tulemusi kiiremini kui eelneva auditoorse koolituse puhul.

Näide 4:
Kindlustusfirma CAN Insurance otsustas 2001. aastal rakendada täiesti uue tegevuste planeerimise süsteemi. Muudatustega oli seotud enam kui 2000 kindlustustöötajat. Senised e-õppe põhised koolitused ei olnud soovitud tulemust andnud (põhjuseks madal osalusprotsent ja töötajate huvipuudus) ja seega otsustati luua peamiselt veebipõhine kombineeritud kursus. Uue lähenemise põhikomponendiks oli veebipõhine töö 15-30-liikmelistes rühmades. Rühma kõik liikmed läbisid kursuse samaaegselt, suhtlesid omavahel kogu kursuse jooksul ja olid kohustatud osalema igas kursuse harjutuses. Lisaks kirjeldatule oli igal rühmal olemas tugiisik, tuutorid ja õppeassistent. Rakendatud e-õppe platvorm ja läbimõeldud osalemissurve tagasid oluliselt suurenenud õppija rahulolu ja õpitulemuste paranemise (Bersin 2004).

Telje-ja-kodara mudel:

Näide 1:
Tootmisfirmas loodud insenerikoolitusel võeti aluseks kombineeritud lähenemine, mis koosnes veebipõhisest ja laboratoorsest osalemissessioonist. Eelneva 9-tunnine auditoorne koolitus asendati kahe 10-tunnise iseseisva veebipõhise õppe ja 8-tunnise laboratoorse sessiooniga. Lisaks toimus üks auditoorne juhendamine informatsiooni kinnistamiseks, kus õppijatel oli võimalik küsimusi esitada ja õppematerjali üle korrata.

Näide 2:
Suur 650 poega USA kaubanduskett tõdes, et senine veebipõhine koolitus ei taga müügitulemuste piisavust ja müüjate pädevust toodete tutvustamisel. Firma otsustas *telje-ja-kodarate* stiilis koolitusprogrammi loomise kasuks, mille põhisisuks oli praktiline kontrollnimekirja vormis ülesehitatud koolitus. Iga osaleja pidi kontrollnimekirja alusel identifitseerima müügil olevad esemed ja sooritama tutvustus- ja müügitegevused. Selle lihtsustatud lähenemise tulemusel saavutati oluline koolituskulude optimeerimine.

Näide 3:
Seoses muudatustega ressursside planeerimise protsessis seisis Rolls-Royce PLC alates 2000. aastast silmitsi vajadusega rakendada lisakoolitusi SAP süsteemi ja uuenenud IT-süsteemi kasutajatele. Eraldi arvutipõhise ja auditoorse koolituse kombinatsioon asendati uue koolitusmudeliga, mille puhul mõlema õppevormi osiseid kombineeriti nii, et igale online moodulile eelnes auditoorne juhendamine. Samuti toimus kogu veebipõhine tegevus instruktori juhendamisel.

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Kombineeritud õppe kasutamine B-Learn projektis osalenud kõrgkoolides

Sissejuhatus

KOMBINEERITUD ÕPPE KASUTAMINE

Järgnevate kirjelduste esitamise eesmärgiks on tutvustada kombineeritud õppe kasutamist reaalses kõrgkooli õppetöös. Kõik kirjeldatud kursused on reaalselt toimivad kursused või kursuse moodulid, mille puhul kombineeritud õppe elemente on edukalt rakendatud. Näited pärinevad eri valdkondadest, kaetud on nii humanitaar- kui ka reaalteadused, samuti nagu ka õpetajakoolitus ja sotsiaalteadused. Järgnevad 14 kursusekirjeldust sisaldavad põhiinfot kursuse teema, pedagoogilise lähenemise, tehnoloogiliste vahendite kasutamise ja kursuse tulemuste kohta. Võimalusel on lisatud ka link kursusele ja kontaktandmed. Paljud siinkirjeldatud kursustest esitatakse detailsemal kujul ka projekti B-Learn raames valminud elektroonilises tugisüsteemis EPSS (vt http://www.ut.ee/blearn/301481).

NÄIDETE VALIK

Valikuprotsessil lähtuti parimate näidete printsiibist nii, et igast osalevates riigist oleks esindatud vähemalt üks kombineeritud õppe praktiline näide. Nagu võis lugeda ka käesoleva kogumiku teoreetilistes käsitlustes, ei ole kombineeritud õppe kohta võimalik välja tuua ühte ja üheselt mõistetavat definitsiooni. Teoreetilistest perspektiividest veelgi ebaselgem ja keerulisem on aga selle nähtuse praktiline kasutus. Kursuste valiku tegemisel lähtuti laiapõhjalisest definitsioonist, mille kohaselt on õigustatud nende kursuste eelistamine, mis on läbi viidud kõrgkooli õppekava raames ja mille õppetöös on kombineeritud auditoorse õppe ja IKT vahendid.

Kursuste koondamisel tekkis kaks ilmset probleemi. Esiteks – kombineeritud õpe ei ole Euroopas terminina kuigivõrd laialt kasutusel ja tulemusena tõdesid B-Learn projektis osalejad, et paljud kõrgkoolipedagoogid õpetavad kombineeritud moel, olemata

ise sellest teadlikud. Euroopa paljudes riikides on kaugõppel pikk ajalugu – vahetegemine nende edastusvormide vahel (kaugõpe, komboineeritud õpe) võib kohati olla aga väga keeruline. Teiseks tuleb tõdeda, et kombineeritud õppe puhul on senini tegemist ikkagi suuresti erasektori koolitust tähistava nähtusega ja ülikoolid on selles valdkonnas pigem tagasihoidlikud. Tulenevalt on paljud head mudelid ja innovaatilised lahendused olnud muudes sektorites kasutusel juba pikki aastaid, samas ei ole need kõrgkooli õppepraktikasse veel jõudnud.

AVATUD SUHTUMINE

B-Learn projekti peamiseks eesmärgiks praktiliste näidete kirjeldamisel oli julgustada õppejõude ja koolitajaid katsetama IKT vahendite rakendamist innovaatilisel moel saavutamaks reaalset kasu nii õppija kui ka õpetaja ja organisatsiooni jaoks. Esimeseks sammuks võib olla kasvõi nii väikse asja nagu e-maili-põhise suhtlemise lülitamine kursusesse. Tulemuseks on paranenud suhtlemine õppejõu ja õppijate vahel. Juba märkimisväärsem samm edasi on näiteks videokonverentsi vahendite kaasamine, wikide, digikaamerate, mobiiltelefonide abil õppimine ja õpetamine. Tehnoloogiad on kõrgkoolides ju reaalselt olemas, ning seda suhteliselt madala tasu eest (kui mitte täiesti tasuta). Kombineeritud õppe kasutuselevõtu ainus takistus...või pigem vabandus, on vähene kujutlusvõime. Seda omakorda püütakse peita ajapuuduse ja väheste oskuste põhjenduste taha. Oskuste puudumist kompenseerib abi küsimine näiteks oma kooli haridustehnoloogilt (jah, kindlasti on selline inimene olemas ka teie koolis). Pikas perspektiivis tagab edukas kombineerimine õppejõule rohkem vaba aega ja võimaluse pühendada rohkem aega kõige olulisematele õpetamise elementidele.

KURSUSED

1. Andmeanalüüs II (Soome)
2. Infojuhtimine ja infosüsteemide arendamine (Soome)
3. Õpiteooriad (Norra)
4. Globaalne keskkond ja arenguteooriad (Norra)
5. IKT vahendid õppetöös (Norra)
6. Publitseerimine Internetis (Norra)
7. Matemaatiline programmeerimine (Leedu)
8. Vajaduste analüüs (Leedu)
9. Orgaaniline keemia (Eesti)
10. Rahvamuusika (Eesti)
11. Haridustehnoloogia (Eesti)
12. Projekti planeerimine ja juhtimine (Eesti)
13. Õppevahendid kutseõpetuses (Eesti)
14. Dünaamiliste süsteemide füüsika (Portugal)

Kombineeritud õppe näiteid

Andmeanalüüs II (Soome)

Kursuse nimi:
Andmeanalüüs II

Kool, osakond, riik:
Helsinki Ülikool, Sotsiaalteaduskond, Matemaatika ja statistika osakond, Soome

Õppeaste, eriala:
Bakalaureuse; Rakendusstatistika

Sihtrühm:
2. ja 3. aasta sotsiaalteaduste tudengid

Kirjeldus:
Andmeanalüüsi metodoloogia kursuse eesmärgiks on õppida, kuidas (1) analüüsida empiirilist andmestikku ja formuleerida, mõõta ja hinnata statistilisi mudeleid ja andmeanalüüsi vahendeid ja (2) esitada uurimistulemusi graafiliste jm statistikaesitlusvahenditega, Kursuse jooksul tuleb läbida 60 tundi sissejuhatavaid loenguid ja juhendatud praktilisi tunde arvutiklassis väikeste rühmadena. Õppijad peavad esitama presentatsioonid oma ülesannete lahendamisest ja kirjutama kursusetöö raporti. Kursuse maht on 10 ECTS.

Pedagoogiline lähenemine:
Kursus on ülesehitatud konstruktivistliku pedagoogika põhimõtetele, ennekõike kognitiivsele konstruktivismile. Rõhku pannakse õppimise ja õpetamise tegevuste detailsele planeerimisele (Biggs 2003). Õppimise põhiprotsess keskendub informatsiooni aktiivsele konstrueerimisele. Õpetaja roll on defineeritud pedagoogilise juhendajana. Õpetamine baseerub diskussioonidel ja õppijate küsimustel, aktiivsel harjutuste lahendamisel. Lisaks kuulub kursuse põhimõtete hulka jagatud tööruum ja õppijate tegevuste jälgimine. Kursuse põhiidee on õppimine kaasõppijate väljapakutud lahendustelt ja presentatsioonidelt ja oma õpiprotsessi jagamine kõikide osalejatega.

Kasutatavad tehnoloogiad:
Kursuse veebilehekülg ja BSCW-õpikeskkond. Kõik kursuse materjalid, k.a õppijate presentatsioonid ja harjutused ning diskussioonirühmade materjalid, on kättesaadavad kursuse veebis.

Kombineeritud õpimeetod:
BSCW on otseselt integreeritud kursusega. Põhiline õpetamismeetod on väikeste rühmadega „loengud", mis põhinevad küsimustel ja diskussioonil, aga BSCW sisaldab ka kõiki kursuse materjale. Tulemusena kasutatakse veebimaterjale ka auditoorse õppe ajal ja mitte ainult eraldiseisva lisavahendina. Keskmiselt jaguneb kursusele pühendatud aeg eri meetodite vahel järgmiselt: 30% veebipõhine õpe, 30% auditoorne õpe ja 30% iseseisev töö.

Õpitulemused ja evalvatsioon:
Veebipõhise õpikeskkonna kasutamine on suurendanud õppijate koostööoskusi ning info ja ideede jagamist. Õpitulemused on paremad kui eelneva puhtalt auditoorse õppe puhul. Õppijate tagasiside on positiivne ning samuti on tänu veebipõhise õppe kasutami-

sele vähenenud õppejõudude töökoormus (enam kasutatakse kollaboratiivse tagasiside võimalust ülesannete hindamisel ja kursuse haldamisel; õppejõu roll on teisenenud diskussioonis osaleja rolliks).

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http://www.valt.helsinki.fi/piirtoheitin/bscw1.htm (soome keeles)

Biggs, John 2003. Teaching for Quality Learning at University. 2nd ed., The Society for Research into Higher Education & Open University Press.

Kontaktandmed:

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Infojuhtimine ja infosüsteemide arendamine (Soome)

Kursuse nimi:
Infojuhtimine ja infosüsteemide arendamine

Kool, osakond, riik:
Jyväskylä Ülikool, Infoteaduste osakond, Soome

Õppeaste, eriala:
Bakalaureuseaste, Infojuhtimise ja infosüsteemide arendamise kursus

Sihtrühm:
Infoteaduste bakalaureuseastme üliõpilased

Kirjeldus:
Kursuse teemad: (1) Info ressursside juhtimine administratiivselt seisukohalt, (2) Info ressursside juhtimine tehnoloogiliselt seisukohalt, (3) Infosüsteemide ehitamine (4) Organisatsioonilised rakendused.
Kursus loodi tuginedes õpikule „IKT juhtimises: Äritegevuse areng digitaalse majanduse tingimustes (inglise keeles „*Information Technology for Management: Transforming Business in the Digital Economy*" (Turban et al. 2002)).
Kursuse kestus on seitse nädalat (sh loengud 36 tundi, kursusetöö ja lõppeksam). Lisaks on olemas veebimaterjalid ja tegevused, mis toimuvad veebikeskkonnas. Kursuse võtmeidee on infosüsteemide aluspõhimõtete omandamine veebipõhiste probleemõppe seminaride käigus. Tudengid peavad ise leidma asjakohased kontseptsioonid ja probleemid, mida on vaja loengutes täpsemalt selgitada.

Pedagoogiline lähenemine:
Konstruktivism, kombineeritakse nii kognitiivset kui ka sotsiaalset konstruktivismi ja probleemõppe meetodeid.

Kasutatavad tehnoloogiad:
Interneti otsingumootorid, tekstitöötlusprogrammid, Optima õpikeskkond.

Kombineeritud õpimeetod:
Vabatahtlikud probleemipõhise õppe seminarid ja lisamaterjalid veebis, kasutamiseks paralleelselt auditoorse õppega. Veebipõhine õpikeskkond (umbes 25%) on loodud loengute (15%) ja iseseisva õppe (60%) toetamiseks.

Õpitulemused ja evalvatsioon:
Kursuse ülesehitus ja kasutatavad meetodid toetavad õppimist mitmel eri viisil, ennekõike kognitiivse ja sotsiaalse konstruktivismi vaimus. Osalejad esitavad kursusetöö, milles kirjeldavad käsitletava valdkonna problemaatikat omal valikul. Kursusetöö koostamiseks kasutatakse interneti otsingumootorite abi; samuti tehakse valminud töö veebis kättesaadavaks kõigile osalejatele. Teise olulise poole moodustavad veebipõhised seminarid, mille käigus õppijad saavad tutvuda kõikide kursusel osalejate töödega.
Kursuse kohta on võimalik lugeda konverentsi ettekannet: Makkonen, P. 2006. *Benefit of an optional problem-based seminar on the web: Comparing ways of learning on the web*. AMCIS Conference, http://amcis2006.aisnet.org/

Lisainfo ja viited:

http://www.cc.jyu.fi/~pmakkone/tjta111/
Biggs, John 2003. Teaching for Quality Learning at University. 2nd ed., The Society for Research into Higher Education & Open University Press.

Kontaktandmed:

Pekka Makkonen (Lektor)
http://www.cc.jyu.fi/~pmakkone/
University of Jyvaskyla FINLAND

Õpiteooriad (Norra)

Kursuse nimi:
Õpiteooriad

Kool, osakond, riik:
Stord/Haugesund Ülikooli Kolledž, Haridusteaduskond, Norra

Õppeaste, eriala:
Kursus 10 ainepunkti ulatuses magistriõppe programmi "IKT vahendid õppetöös" raames

Sihtrühm:
Õpetajad, õpetajakoolituse tudengid, e-õppe tuutorid ja arendajad

Kirjeldus:
Selles moodulis tutvuvad osalejad õpiteooriatega ja digitaalsete vahendite kasutamise meetoditega õppetöös. Kursuse keskne sisu on IKT vahendite kasutamine ja õppetegevusse integreerimine.

Sisu:

- Õppimise juhendamine
- Mälu
- Metatunnetus
- Teadmusülekanne
- Sotsiaalne õppimine

Erinevad õppimise teooriad seostatakse praktiliste situatsioonide ja kogemusega.

Pedagoogiline lähenemine:
Kursustes kasutatakse:

- Auditoorset õpetamist ja tuutoreid
- Veebipõhist juhendamist
- Videoülekandeid

Pedagoogilised lähenemised:

- Kollaboratiivne õppimine ja konstruktivistlik õppimine
- Probleemipõhine õpe
- Projektipõhine õpe.

Kõik käsitluse all olevad teooriad seostatakse ja kaasatakse õpetamisse nii päevase (*on-campus*) kui ka kaugõppe tudengite (*off-campus*) puhul.

Kasutatavad tehnoloogiad:
Kursus on mõeldud nii päevaste kui ka kaugõppe üliõpilaste jaoks. Tagamaks mõlema õpperühma jaoks sobivat programmi, kasutatakse kursuse läbiviimiseks suures osas veebi ja õpihalduskeskkonna võimalusi. Veebipõhiselt on läbi viidud järgmised tegevused:

- Materjalide levitamine
- Videomaterjalide levitamine (nii sünkroonne kui ka asünkroonne)
- Suhtlemine (õpetaja ja õppija vahel ja õppijad omavahel)
  - Asünkroonne kommunikatsioon
  - Juhendid
  - Koostöö ja ühisõpe

Kombineeritud õpimeetod:
Auditoorsed loengud moodustavad väikse osa kursusest. Loengud kantakse üle ka videoloengutena ning need on hiljem kättesaadavad salvestustena. Juhendamine sõltub tudengite asukohast. Päevase õppe tudengitel on võimalik saada juhendamist auditoorses vormis, kaugõppes õppijate puhul kasutatakse juhendamiseks e-maili, õpihaldussüsteemi, sünkroonse kommunikatsiooni vahendeid (MNS) ja asünkroonseid kommunikatsioonivahendeid (diskusioonifoorumid). Kogemus näitab, et ka päevase õppe tudengid soovivad õppimiseks ja suhtlemiseks kasutada suures osas samasid vahendeid. Suhtlemine õppijate vahel rühmades, kuhu kuulub nii kohapeal kui kaugõppes õppivaid tudengeid, on samuti korraldatud sünkroonsete ja asünkroonsete diskussioonivahendite abil.

Õpitulemused ja evalvatsioon:
Kursuse on läbinud 40 magistriõppe tudengit. Väljalangenute osakaal on väga väike. Õppijate tagasiside on üldiselt väga positiivne.

Lisainfo ja viited:
http://stud.hsh.no/lu/inf/master/ (norra keeles)
http://www.hsh.no/english/ICT_in_Learning.pdf (inglise keeles)

Kontaktandmed:
Jostein Tvedte
jostein.tvedte@hsh.no
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Globaalne keskkond ja arenguteooriad (Norra)

Kursuse nimi:
Globaalne keskkond ja arenguteooriad

Kool, osakond, riik:
Agderi Ülikooli Kolledž, Majanduse ja sotsiaalteaduste teaduskond, Arengu-uuringute instituut, Norra

Õppeaste, eriala:
Keskkonnateaduste magistriprogramm. Teema: Globaalne keskkond.

Sihtrühm
Aafrika and Norra tudengid seonduva bakalaureuseharidusega; vajalik hea inglise keele oskus ja huvi jätkusuutliku arengu küsimuste vastu.

Kirjeldus:
Programmi eesmärk on tutvustada arengu- ja keskkonnateooriaid ja uurimistulemusi ning sobivaid juhtimisvahendeid praktiliste küsimustega tegelemiseks. Lahenduste leidmiseks tegeletakse eri uurimisvaldkondade problemaatikaga, sh nt majandus ja juhtimisteooriad, poliitikateadus, sotsioloogia, antropoloogia, geograafia. Käsitletakse erinevaid institutsionaalseid kontekste (kohalik omavalitsus, rahvusvaheline äritegevus, valitsusvälised organisatsioonid, riiklikud valitsusinstitutsioonid, rahvusvahelised ja riiklikud seadusandlikud ja doonororganisatsioonid). Tudengid kohtuvad näost näkku üks või kaks korda õppeprogrammi vältel. Programmi kestus on kaks aastat.

Pedagoogiline lähenemine:
Peamiselt sotsiaalkonstruktivism

Kasutatavad tehnoloogiad:
Internet, õpihaldussüsteem, video, CD-ROM

Kombineeritud õpimeetod:
Kaheaastase täiskoormusega õppeprogrammi jooksul kohtuvad osalejad ja õppejõud kaks korda kuuekuulise perioodi järel. Esimese kahenädalase kohtumise eesmärk on tutvumine, õpihaldussüsteemi vahendite kasutamisoskuse omandamine ja virtuaalses õpikeskkonnas sotsiaalkonstruktivistlike pedagoogiliste meetodite kasutamise omandamine.

Teine reaalne kohtumine (4 nädalat) toimub õppijate, õppejõudude ja tuutorite osalusel Lõuna-Aafrika Vabariigis. Esimese kahe nädala jooksul toimub aktiivosalusega koolitus GIS süsteemide kasutamise kohta. Ülejäänud kaks nädalat pühendatakse uurimismeetodite ja intervjueerimistehnikate omandamiseks. Kogu ülejäänud programm läbitakse veebipõhise kollaboratiivse õppe vormis. Programmis kasutatakse nn kvaliteedikindlustamise süsteemi – kõigile õppijatele (3-4 igas riigis) tagatakse arvutiga töökohad ja vajalik infrastruktuur nende enda koduülikoolis. Osalejatel on võimalus arutada ülesannetega seonduvatel teemadel enne virtuaalsesse klassiruumi sisenemist.

Õpitulemused ja evalvatsioon:
Programmi läbimise järel peaksid õppijad olema omandanud järgmised oskused:

- Arenguriikide kontseptsiooni ja aktuaalsete arenguprobleemide analüüsimine erinevate osalejate vaatenurkadest
- Juhtimise, abiprogrammide ja globaliseerumise omavaheliste seoste analüüsioskus
- Kirjeldama ja arutlema linnastumise, väikelinnade arengu, maapiirkondade arengu teemadel
- Kirjeldama maailma inimkonna arengutrende ja analüüsima ülerahvastatuse problemaatika teemal
- Jätkusuutliku arengu kontseptsiooni analüüs rikaste ja vaeste riikide kontekstis.

Osalejad saavad kursuse käigus järgmised oskused ja teadmised:

- kollaboratiivne õppimine auditoorse ja veebipõhise keskkonna tingimustes: ideede jagamine, probleemide analüüsimine, läbirääkimised, lahenduste leidmine.

Eksamitulemused esimese aasta läbinutel: Keskmine tulemus.

Lisainfo ja viited:
http://www.hia.no/oksam/english/mdevm/index.php3
http://www.gvu.unu.edu/prog.cfm

Kontaktandmed:
Arne Olav Øyhus
arne.o.oyhus@hia.no

Bodil Ask
bodil.ask@hia.no

Aake Bjoerke
bjoerke@grida.no

IKT vahendid hariduses(Norra)

Kursuse nimi:
IKT vahendid hariduses (magistriprogramm, 120 ainepunkti)

Kool, osakond, riik:
Stord/Haugesund Ülikooli Kolledž, Haridusteaduse osakond, Norra

Õppeaste, eriala:
Magistritaseme kursus, IKT vahendite rakendamine ja integreerimine õppetöösse

Sihtrühm:
Õpetajakoolituse tudengid, õpetajad ja IKT-põhiste õpisüsteemide arndajad

Kirjeldus:
Kursuse keskseks teemaks on IKT vahendite kasutamine ja integreerimine õppetöösse. Õppe taust on küll pedagoogika-alane, aga see ei ole kursus õppemeetoditest JA pedagoogikast eraldiseisvaina. Õppetöö baseerub sarnastel kursustel mujal maailmas. Kursus moodustab õpetajakoolituse tudengite neljanda ja viienda aasta programmi ja lõpeb õpetajakutse ja magistrikraadiga (IKT hariduses)

Pedagoogiline lähenemine:
Kursusel kasutatakse:

- Auditoorset õpet ja tuutoreid
- Veebipõhist juhendamist
- Kohustuslikke seminare, mille käigus õppijad kohtuvad näost näkku ülikooli kolledži ruumides (võimalik korraldada seminare ka videokonverentsi vormis)

Magistriprogrammi eri kursused on üles ehitatud sobivaile pedagoogilistele lähenemistele. Rakendatakse järgmisi teooriaid ja mudeleid:

- Kollaboratiivne ja konstruktivistlik õpetamine
- Probleemipõhine õpe
- Projektipõhine õpe

Kõiki teooriaid rakendatakse nii päevase kui ka kaugõppe vormis õppivatele rühmadele.

Kasutatavad tehnoloogiad:
Kursus on mõeldud nii päevaste kui ka kaugõppe üliõpilaste jaoks. Tagamaks mõlema õpperühma jaoks sobivat programmi, kasutatakse kursuse läbiviimiseks suures osas veebi ja õpihalduskeskkonna võimalusi. Veebipõhiselt on läbi viidud järgmised tegevused:

- Materjalide levitamine
- Videomaterjalide levitamine (nii sünkroonne kui ka asünkroonne)
- Suhtlemine (õpetaja ja õppija vahel ja õppijad omavahel)

- Asünkroonne kommunikatsioon
  - Juhendid
  - Koostöö ja ühisõpe

Kombineeritud õpimeetod:
Auditoorne õppetöö moodustab suhteliselt väikese osa õppetööst. Mõne alamkursuse puhul on auditoorse õppe läbimiseks võimalik kasutada ka videokonverentsi vahendeid.
Juhendamine toimub vastavalt tudengite asukohale.
Päevase õppe tudengitel on võimalik saada juhendamist auditoorses vormis, kaugõppes õppijate puhul kasutatakse juhendamiseks e-maili, õpihaldussüsteemi, sünkroonse kommunikatsiooni vahendeid (MNS) ja asünkroonseid kommunikatsioonivahendeid (diskusioonifoorumid). Kogemus näitab, et ka päevase õppe tudengid soovivad õppimiseks ja suhtlemiseks kasutada suures osas samasid vahendeid. Suhtlemine õppijate vahel rühmades, kuhu kuulub nii kohapeal kui kaugõppe õppivaid tudengeid, on samuti korraldatud sünkroonsete ja asünkroonsete diskussioonivahendite abil.

Õpitulemused ja evalvatsioon:
Praeguseks on programmi läbinud 20 tudengit, õpitulemused on olnud head. Õppijate tagasiside (veebipõhine küsitlusvorm) on olnud positiivne, aga vajalikuks on peetud õpisisu, meetodite ja tehnoloogiliste vahendite arendamist. Edasiarendatud versioon magistriprogrammist käivitus 2007. aasta augustis.

Lisainfo ja viited:
http://stud.hsh.no/lu/inf/master/ (norra keeles)
http://www.hsh.no/english/ICT_in_Learning.pdf (inglise keeles)

Kontaktandmed:
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+47 53 49 13 78

Publitseerimine Internetis (Norra)

Kursuse nimi:
Publitseerimine Internetis

Kool, osakond, riik:
Sør-Trøndelagi Ülikooli Kolledž, Informaatika ja e-õppe osakond, Norra (Õppejõud: Svend Andreas Horgen)

Õppeaste, eriala:
Veebitehnoloogiate algkursus HTML and JavaScripti tutvustamiseks, üldine ülevaade veebitehnoloogiatest.

Sihtrühm:
Informaatika ja majanduse esimese aasta tudengid

Kirjeldus:
Õppijate aktiivse osalemise suurendamiseks on kasutusele võetud e-õppe vahendid, auditoorsete loengute asemel kasutatakse arvutiklasse. Tulemusena on võimalik operatiivselt vahetada teemat teoreetiliste ja praktiliste tegevuste vahel. Kasutusel on ka õpihaldussüsteem kombineeritud õppe kogemuse avardamiseks. Kursuse jooksul kasutatakse järgmisi tegevusi:

- Küsitluslehed enne teoreetilise osa algust. Tulemusena saavutatakse õppija parem haakumine õppeteemaga ja õppijad omandavad loengu jooksul rohkem teadmisi.
- Teoreetiline ülevaade (15-20 minutit).
- Valikvastustega küsimustik või muu praktiline ülesanne, võimalik ka õpihaldussüsteemi vahendusel.
- Järgmine teoreetiline osa (15-20 minutit).
- 20-minutiline paus, millele eelneb küsitlusleht loengumaterjalide kohta. Õppejõul on võimalk operatiivselt saada tagasisidet vääralt omandatud kontseptsioonide ja lünkade kohta teadmistes.
- Sarnasel põhimõttel on üles ehitatud kogu kursus. Samuti on rakendatud kaksikloengut, kus kaks õppejõudu käsitlevad erinevaid teemasid paralleelselt ja dialoogis õppijatega. Sellise lähenemise tulemusel on saavutatud õppijate oluliselt kõrgem motivatsioon õppematerjali omandamiseks. Sarnased kaksikloengud toimusid kursuse esimese ja viimase loenguna.

Kasutati Podcasti: veebist valitud sobiv podcasti fail laeti alla, kuulati loengu käigus 5-10 minutit ja seejärel toimus arutelu väikestes rühmades 5-10 minutit (Eesmärk: sisu mõistmine ja suhestamine teooriaga) + kokkuvõte 5-10 minutit.

Kasutatavad tehnoloogiad:
LMS-süsteem, igal õppijal juurdepääs arvutile (koos vajaliku helisüsteemiga).

Kombineeritud õpimeetod:
Vt. kursuse kirjeldus

Õpitulemused ja evalvatsioon:
Informaalne tagasiside kinnitab, et õppijate rahulolu on suurenenud. Need, kes ei saa osaleda konkreetses õppetunnis, saavd kasutada võimalust materjalidega tutvumiseks õpihaldussüsteemis.

Lisainfo ja viited:
http://www.aitel.hist.no/~svendah/FoU/PPT/horgen-blended-learning-steinkjer-oktober-2006.ppt (norra keeles)

Kontaktandmed:
Svend Andreas Horgen
svend.horgen@hist.no

Matemaatiline programmeerimine (Leedu)

Kursuse nimi:
Matemaatiline programmeerimine

Kool, osakond, riik:
Vytautas Magnuse Ülikool, Rakendusinformaatika osakond, Kaunas, Leedu

Õppeaste, eriala:
Bakalaureuseõppe 4. aasta üliõpilased, Matemaatiline programmeerimine

Sihtrühm:
Informaatika, majanduse, inseneriteaduste ja rakendusmatemaatika tudengitele

Kirjeldus:
Kursuses kombineeritakse teoreetilisi käsitlusi ja praktilisi lähenemisi. Kursuse põhieesmärk on õppijate praktiliste oskuste arendamine selliselt, et õppija suudaks formuleerida praktilisi matemaatilisel terminoloogial baseeruvaid optimeerimisülesandeid, oskaks rakendada teoreetilisi mudeleid ja leida sobivaid algoritme praktiliste matemaatiliste ülesannete lahendamiseks ja mõistma optimeerimise tulemusi. Samuti peaks õppija kursuse jooksul suutma juhendada ja kommenteerida teiste õppijate pakutud lahendusi.
Kursusel käsitletakse probleemide klassifikatsioone ja lahendusmudeleid (Gradient meetod, pööratud gradient meetod. Newtoni Meetod ja selle modifikatsioonid. Otsingumeetodid.).
Veel käsitletavaid teemasid: piirangutega ülesannete miinimumtingimused; piirangute ja penalti meetodid tingimuslike ülesannete lahendamisel. Lineaarne programmeerimine. Aluslahendid. Simplex algoritm. Polünoomilise funktsiooni meetod lineaarses programmeerimises. Mitmetingimuslik optimeerimine.
Kursuse loomisel võeti arvesse sarnaste kursuste kogemusi maailmas ning akumulatiivse kogemuse mudeli rakendamismudelit optimeerimise õpetamisel

Pedagoogiline lähenemine:
Kursuse põhimõtted baseeruvad projektõppe meetodil. Kursuse väljatöötamisel analüüsiti teiste ülikoolide kogemusi sarnaste kursuste väljatöötamisel. Kursusele eelnevad kohustuslikud ained töötlussüsteemidest ja simulatsioonidest tagavad õppijate vajalikud eeldusoskused ja süsteemide loomise kogemuse. Traditsioonilisi õpetamismeetodeid kombineeritakse projektõppe meetodite ja diskussioonipõhise õppega. Teoreetiline osa läbitakse iseseisvalt ja toetavate loengutena, olemas on ka veebipõhised loengusalvestused. Diskussioonide käigus arutletakse õppejõu poolt püstitatud teemadel. Kõik ülesanded on kohustuslikud ja tuleb esitada vastavalt veebipõhises kalendris kehtestatud tähtaegadele. Veebis on olemas ka informatsioon õppejõudude vastuvõtuaegade kohta.

Kasutatavad tehnoloogiad:
1. Laboratoorsete tööde juhendid on kättesaadavad kursuse veebilehekülgel. Lisamaterjalid (ka teoreetilised materjalid edasijõudnutele) ja näited lahendusvariantide kohta (loodud tudengite poolt) ning viited olemasolevale tarkvarale on samuti kättesaadavad veebilehel.
2. Elektrooniline sõnaraamat
3. Diskussioonifoorumid

4. E-mail õppejõuga suhtlemiseks
5. Videoloengud
6. Õpihaldussüsteem (FirstClass)

Kombineeritud õpimeetod:
Auditoorsed loengud (15 2-tunnist loengut) ja seminarid + veebipõhine suhtlemine tudengitega (foorumid, veebipõhised küsitluslehed, videokonverentsid, veebipõhised õppematerjalid, õppijate iseseisvate tööde esitamine veebis, kokku 52 tundi iseseisvat tööd), 15 laboratoorse töö loengut.

Lisainfo ja viited:
E-raamatud:
1. Antanas Žilinskas, Matematinis programavimas (pdf ja html formaatides, leedu keeles);
2. Benny Yakir, Nonlinear optimization (pdf fail);
3. Jonas Mockus, Global and discrete optimization (html);
4. Artikkel: "Jens Clausen Teaching Duality in Linear Programming - the Multiplier Approach' (pdf fail).

Kursuse veebileht: http://fcim.vdu.lt/Conferences/F00017C98/F00052D02/?WasRead=1
Kursusel kasutatav sõnaraamat ja juhend: http://mathworld.wolfram.com/

Lisamaterjalid:
1. Žilinskas A. Matematinis programavimas. VDU, 1999.
2. Bazaraa M., Sherali H., Sheti C., Nonlinear programming. J.Wiley, 1993.
3. Bertsekas D. Nolinear Programming. Athea Scienfic,1995.

Kontaktandmed:
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antanasz@ktl.mii.lt
+370 37 327900

Vajaduste analüüs (Leedu)

Kursuse nimi:
Vajaduste analüüs

Kool, osakond, riik:
Kaunase Tehnikaülikool, Tarkvarasüsteemide osakond, Kaunas, Leedu

Õppeaste, eriala:
Õpimoodul Vajaduste analüüs on üks neljast tehnoloogiateaduste valdkonna tarkvarasüsteemide magistriüliõpilaste uurimismoodulist. Ülejäänud moodulid programmis on 'Tarkvarasüsteemide arhitektuur", „IKT projektijuhtimises" ja „Tarkvara rakenduste analüüs".

Sihtrühm:
Informaatikateaduskonna magistriüliõpilased

Kirjeldus:
Kursuse põhisisuks on vajaduste analüüs ja spetsifikatsioonid. (Alammoodulid „Tarkvara vajaduste analüüs" ja „Simulatsiooni ja valideerimise süsteemid"). Magistrantidel on seega olemas eelnev kogemus meetodite ja vahendite kasutamisest. Pärast kursuse lõppu saavad üliõpilased rakendada omandatud teadmisi magistritöö koostamisel. Eelpoolnimetatud kursustega samaaegselt läbivad magistrandid ka kursused „Tarkvara loomise protsess" ja „Tarkvara loomise juhtimine". Kursuste käigus omandavad üliõpilased teadmised ja oskused standardite, ülesandepüstituse, planeerimine ja vajaduste analüüsi kohta. Olulisemad teemad: Tarkvara vajaduste dokumenteerimine; Vajaduste evolutsioon; Probleemi analüüs; Süsteemi mudeli kirjeldus; Andmemodelleerimine; Funktsionaalsed ja mittefunktsionaalsed vajadused; Prototüüpide kasutamine; Tarkvara vajaduste dokumenteerimine.

Pedagoogiline lähenemine:
Kombineeritakse ennekõike teoreetilisi ja praktilisi teadmisi ja oskusi, et õppija oskaks disainida ja valmistada tarkavaralahendusi vastavalt tellija vajadustele. Kursuse käigus õpitakse hindama, analüüsima ja simuleerima tarkvarasüsteemide kvaliteedifaktoreid süsteemse ja kontrollitava tarkvaraarenduse protsessi juhtimiseks. E-õppe vahendite kasutamine on kursusel kesksel kohal. Kõik kursuse organisatoorsed materjalid on olemas veebipõhiselt. Kursus baseerub teooria ja praktika ühendamise põhimõttel, õppijalt eeldatakse süstemaatilist ja olulisel määral iseseisvat tööd. Eriti olulisel kohal on õppija praktilise disainimise oskuste arendamine ehk teisisõnu õpetamine disainides. Pedagoogilise lähenemise vaatepunktist on tegemist projektipõhise probleemõppega.

Kasutatavad tehnoloogiad:
1. Kursuse veebilehekülg (http://soften.ktu.lt/~virga/mag_atmintine). Leheküljel on esitatud teemad, dokumendimallid, näited, standardid, nõuded ülesannete esitamisele, ajakava, eeldused kursusel osalemiseks; kvaliteedinõuded, tähtajad ja õppematerjalid.
2. Iga osaleja esitab informatsioonisüsteemi kursuse alguses. Kohustuslik on kokku koguda kõik kursuse jooksul valminud materjalid. Tegemist on isikliku materjalide haldamise süsteemiga. Kõik sellised leheküljed on kaitstud salasõnaga.
3. E-mail ja seminarid õppejõuga suhtlemiseks.
4. Diskussioonifoorum http://proin.ktu.lt.

Kombineeritud õpimeetod:
Auditoorsed loengud ja seminarid ning veebipõhine suhtlemine tudengitega. Tehnoloogilisi vahendeid kasutatakse suhtlemiseks, infovahetuseks, kodutööde esitamiseks ja hindamise läbiviimiseks.

Õpitulemused ja evalvatsioon:
Hindamise eesmärgiks on selekteerida efektiivsed strateegiad ja tehnoloogiad nende edasiseks arendamiseks. Tarkvaraprojektide hindamise eesmärgiks on parem arusaam tarkvaraprojektide ülesehitusest ja meeskondadest. Sellised teadmised on möödapääsmatud tarkvaraarenduse edendamiseks.

Nelja mooduli läbimise järel:

- Keskmine hinnang kursuse kvaliteedile tuutoritelt 9.72;
- Keskmine hinnang kursuse kvaliteedile magistrantidelt 8.33;
- Keskmine hinnang tuutorite tegevusele magistrantidelt 8.28;
- Keskmine hinnang programmi ülesehitusele magistrantidelt 7.71;
- 43% õppijatest leidis, et kursuse maht on liiga suur, 57% pidas mahtu optimaalseks;
- Keskmine hinnang magistrantide praktilistele oskustele praktikajuhendajatelt ettevõtetes oli väga kõrge – 9.93;
- Ainult 76% õppijatest leidis, et praktika on õppetöö vajalik koostisosa;
- Praktikateema seostus tudengite magistritöö teemaga 62% õppijatest.

Lisainfo ja viited:
Õppematerjalid kättesaadavad: http://proin.ktu.lt/~kestas/Proj_vald/Kepure.html (leedu keeles)
Tarkvarasüsteemide standardid: http://soften.ktu.lt/~virga/mag_atmintine/1sem/standartai.htm
Muu kirjandus: http://soften.ktu.lt/~virga/mag_atmintine/interneteka.html
Veebipõhiselt on olemas ka palju praktilisi näiteid ja juhendmaterjale.
Lisamaterjalid (inglise keeles):

1. I.Sommerville. Software Engineering. Addison-Wesley, 4,5, 6 trükk
2. R.S. Presman and D.Ince. Software Engineering - A Practitioner's Approach. McGraw-Hill, 3, 4,5 trükk
3. G.Booch. Object-Oriented Analysis and Design. The Benjamin/ Cummings Publishing Company, Inc., 1994
4. R Pooley ja P Stevens. Using UML: Software Engineering with Objects and Components. Addison-Wesley, 1999
5. M.Cotterell, B.Hughes. Software Project Management. International Thompson Computer Press, 1995
6. G.Booch, J.Rumbaugh, I.Jacobson. Unified modeling language user guide. Addison-Wesley, 1998
7. I.Jacobson, G.Booch, J. Rumbaugh. The Unified Software Development Process. Addison-Wesley, 2000
8. J.Martin and J. Odell. Object-Oriented Methods: a Foundation. Second UML Edition. Prentice-Hall, 1998
9. C.Larman. Applying UML and Patterns. Prentice-Hall, 2000

etc.

Kontaktandmed:

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Orgaaniline keemia (Eesti)

Kursuse nimi:
Orgaaniline keemia

Kool, osakond, riik:
Tallinna ülikool, Loodusteaduste osakond, Eesti

Õppeaste, eriala:
Bakalaureuseõpe

Sihtrühm:
2. aasta bakalaureusetudengid, kelle peaerialaks on bioloogia ja kõrvalerialaks keemia.

Kirjeldus:
Kursus annab ülevaate orgaanilisest keemiast bioloogia ja keemia tudengitele, lisaks on kursus kasulik neile, kelle töö on seotud organilise keemiaga ja kes vajaks sellealaseid lisateadmisi. Kursuse eesmärgiks on tutvustada orgaanilise keemia põhialuseid, analüüsi-, puhastamise ja sünteesimise tehnikaid. Orgaanilise keemia aine on eelduseks bioorgaanilise keemia, biokeemia ja keskkonnakeemia ainetele.

Pedagoogiline lähenemine:
Aine eripära tõttu (palju faktiteadmisi ning matemaatilist ja abstraktset mõtlemist vajav aine) on orgaanilise keemia õpetamisel tavapärasest mõnevõrra raskem kasutada erinevaid aktiivõppemeetodeid (arvukad rühmatööd, rollimängud jne).
Aruteluks laboripraktikumides läbitehtud eksperimendikäikude üle kasutati foorumit IVA e-õppe keskkonnas. Nii said üliõpilased katsetulemusi paremini võrrelda ning arutleda selle üle, miks üks või teine eksperiment hästi ei õnnestunud.
Antud kursuse raames tuli igal üliõpilasel koostada lühireferaat, mida retsenseerisid kirjalikult mitu kaasüliõpilast. Retsensioonide valmimise juures oli teatav osa rühmatööl, sest retsensioonid valmisid arutluse tulemusel sama tööd hindavate üliõpilaste vahel. Seejuures pidi iga retsensent lähtuma küsimusele erineva nurga alt (retsensioonid ei tohtinud olla identsed).

Kasutatavad tehnoloogiad:
Arvutid, data-projektor, õpihaldussüsteem IVA, MDL Isis Draw, erinevad tarkvarad.

Kirjeldus, kuidas tehnoloogia oli kasutusel:
Enamik tegevusi leidis aset õpihaldussüsteemis IVA. Modelleerimiseks kasutati arvuteid ja erinevaid tarkvaralisi lahendusi. Õpetaja esitas oma materjalid arvuti ja dataprojektori abil, samal moel esitasid õpilased oma presentatsioone.

Õigustus tehnoloogia kasutamiseks:
Tänapäeval on väga raske modelleerida molekule ilma tehnoloogiliste vahendite abita. Samuti on konstruktivistliku õppimisviisi läbiviimiseks väga kasulik veebipõhise õpihaldussüsteemi IVA kasutamine.

Kombineeritud õpimeetod:
Kursus on osaliselt veebipõhine, märkimisväärne osa kursusest toimub õpihaldussüsteemis IVA. Kursus sobib nii päevase õppe tudengitele kui ka tööalaselt täienduskoolitust vajavatele inimestele. Kursuse läbimiseks on vajalik hea faktiteadmine ja mälu ning abstraktne mõtlemine.
Kursus on kombineeritud kursus, mille jooksul toimub 1,5 tunnine sissejuhatav loeng, 3 tunnine seminar ja 34 tunni ulatuses praktikume. Õppematerjalid on suuresti .pdf formaadis ja presentatsioonidena. Kasutusel on palju värvilisi illustratsioone – skeemid ja diagrammid, mis teeb õppematerjalide väljaprintimise õppija jaoks keeruliseks. Materjale (sh video) jaotatakse CD-ROMil.

Õpitulemused ja evalvatsioon:
Kursust on läbi viidud kaks korda ja mõlemal korral edukalt. Kursus osutus edukaks ning üliõpilaste eksamitulemused (kontrollituna auditoorsel eksamil) olid tavapärasest paremad.
Kursuse lõpetas 24 üliõpilast (registreerunuid oli 26). Aine läbimise eelduseks oli kõigi laboratoorsete tööde sooritamine. Kursuse sooritamiseks oli vaja teha veebipõhine test (10% lõpphindest), presentatsioon (10%). Lisaks tuleb kaitsta laboratoorsete tööde tulemused (15%) ja sooritada lõpueksam (auditoorne, 40% lõpphindest). Aktiivne osalemine IVA keskkonnas on oluliselt tõstnud lõpphindeid.

Lisainfo ja viited:
http://iva.tlu.ee/IVA
kasutaja: DEMO
parool: DEMO

Kontaktandmed:
Rando Tuvikene
Tallinna Ülikool
Narva mnt 25, 10120 Tallinn
rantuv@tlu.ee
6 409 405
Fax: 6 409 418
GSM: 555 88 222

Etnomuusika (Estonia)

Kursuse nimi
Etnomuusika

Kool, osakond, riik:
Tallinna ülikool, Kunstiosakond, Eesti

Õppeaste, eriala:
Magistritaseme õpe (muusikaharidus)

Sihtrühm:
Muusikahariduse õppekava magistritaseme üliõpilased (ühised rühmad päevase õppe ja kaugõppe üliõpilastele). Kursusele on vaba juurdepääs valikainena ka teiste teaduskondade üliõpilastel.

Kirjeldus:
Etnomuusika kursuse eesmärgiks on toetada oskust analüüsida pärimusmuusikas sisalduvaid didaktilisi võimalusi kasutamaks neid pedagoogilises töös lastega; toetada multikultuurilises ühiskonnas orienteeruva, rahvuslikke traditsioone väärtustava muusikapedagoogi kujunemist;
toetada tolerantsi kujundamise oskust maailmamuusika õpetamise kaudu.
Praktiline ülevaade traditsioonilisest Eesti muusikast, naabrite muusikast ja kogu maailma muusikast. Näited laulmisest, tantsimisest ja kuulamisest. Kursus keskendub lähinaabrite (Läti, Leedu, Ukraina, Soome, Rootsi, Norra, aga ka Aasia ja Ameerika rahvaste) muusikale, eriti rahvamuusikale ja –kultuurile. Tähelepanu pööratakse mitte ainult muusikale, vaid ka tekstile, pildimaterjalile ja videole. Mahukas digitaalne õppematerjal on alati ligipääsetav ja õppijad saavad seda kasutada enda töös. Kursus demonstreerib muusikaõpetajatele, kuidas on võimalik interaktiivselt ja reflektiivselt õpetada muusikat põhikoolis. Kursuse eesmärgiks on saavutada õppijate oskus analüüsida rahvamuusika õpetamise didaktilisi külgi ja kasutada neid enda töös koolilastega. Samuti omandavad õppijad oskuse naaberrahvaste rahvakultuuri äratundmiseks ja eri rahvaste muusika analüüsimiseks. Arvuti kasutamine on oluline osa õppe-, suhtlemise-, ja presentatsioonide esitamise vahendina.

Pedagoogiline lähenemine:
Konstruktivistlik lähenemine.
Individuaalselt peavad õpilased läbi töötama kursuse kirjanduse ja materjalid. Lisaks valmistama ette presentatsiooni ühe rahva muusikast ja selle laadima IVA keskkonda (kas .ppt failina või lindistatud audiofailina). Lisaks peavad üliõpilased lahendama veebipõhiseid ülesandeid (lünktekstid ja ristsõnad) ning osalema diskussioonides.
Kursuse lõpus toimub kaks testi. ¾ kursust toimub veebipõhiselt.

Kasutatavad tehnoloogiad:
Arvutid, dataprojektor, õpihaldussüsteem IVA, blogid, veebipõhised õppematerjalid, MS Office, multimeedia töövahendid. Valdav enamik kogu kursuse õpitegevustest toimub veebipõhises õpikeskkonnas IVA. On palju lihtsam kasutada audiofailide jagamiseks veebipõhist õpikeskkondakui jagada õpilastele CD plaate või kuulata näiteid tunnis.

Kombineeritud õpimeetod:
Iseseisvate ülesannete puhul peavad tudengid tegelema kirjanduse ja kursuse materjalidega. Samuti tuleb ette valmistada presentatsioon ühe rahvuse muusika kohta (esitatakse IVA keskkonnas .ppt formaadis. Samuti tuleb lahendada veebipõhiseid ülesandeid (lünkharjutused) ja osaleda diskussioondies. Kursus lõpeb kahe testiga (Läti ja Leedu muusika kohta). 75% kursusest on ette nähtud veebipõhiseks läbimiseks ja toimub IVA keskkonnas.

Õpitulemused ja evalvatsioon:
Kõik tudengid lõpetasid kursuse. Oli väga oluline, et tudengid oleksid aktiivsed diskussioonides ja osaleksid kontaktpäevadel. Mitmed projektiplaanid, mis tudengid kirjutasid, olid väga realistlikud ning nad plaanivad need ellu viia. Kursuse sooritamiseks oli vajalik läbida vähemalt 50% teoreetilistest loengutest ja individuaalsed tööd, samuti on oluline osalemine diskussioonides ja praktikumides.

Lisainfo ja viited:
Kursus valiti aasta e-kursuseks 2004 multimeedia vahendite kasutamise kategoorias (http://www.e-uni.ee/index.php?main=148)
Kõik materjalid on olemas IVA keskkonnas (http://iva.htk.tpu.ee)

Kontaktandmed:
Tiina Selke
tiina.selke@mail.ee

Haridustehnoloogia (Estonia)

Kursuse nimi:
Haridustehnoloogia

Kool, osakond, riik:
Tallinna ülikool, Kasvatusteaduste osakond, Eesti

Õppeaste, eriala:
Kasvatusteaduste magistriastme tudengite sissejuhatav kursus

Sihtrühm:
Rühmas vähemalt 10 tudengit, enamik haridusteaduse ja hariduse juhtimise magistriõppe tudengid.

Kirjeldus:
Kursus keskendub didaktilistele küsimustele, ennekõike IKT vahendite kasutamismeetoditele õppetöös. Kursuse eesmärk on arendada õppija oskusi digitaalsete õppematerjalide loomisel ja kasutamisel. Kursuse käigus läbitakse järgmised teoreetilised punktid: haridustehnoloogia põhikontseptsioonid; arvutid Eesti hariduses – ajalugu ja hetkeolukord; IKT hariduspoliitikas; IKT vahendite kasutamise didaktika; Eesti haridustehnoloogiliste uurimuste ülevaade; IKT standardid riiklikus õppekavas; IKT vahendite kasutamise meetodid; IKT-alased integreeritud õppeprojektid.

Pedagoogiline lähenemine:
Kursus põhineb konstruktivistlikul õppimismeetodil. Õpihaldussüsteem IVA toetab seda meetodid väga hästi. Õpilased loovad ja arendavad ise õppematerjale, lisaks vaatavad ja kommenteerivad kaasõpilaste töid õpihaldussüsteemis.

Kasutatavad tehnoloogiad:
Arvutid, dataprojektor, õpihaldussüsteem IVA, eFormular, HotPotatoes. Suhtlus õpilase ja õppejõu vahel toimub õpihaldussüsteemis IVA. Õppematerjalide loomiseks ja arendamiseks õpilaste poolt kasutatakse mitmeid erinevaid tehnoloogilisi vahendeid ja tarkvarasid.
Peamine põhjus õpihaldussüsteemi ja teiste tehnoloogiliste vahendite kasutamiseks seiseneb vajaduses arendada õpilaste oskusi arvuti kasutamisel ja demonstreerida, kuidas haridus ja õpetamine saaks ja võiks olla tehnoloogiliste vahenditega ühendatud ja rikastatud.
Kõik auditoorsed tegevused toimuvad arvutiklassis, igal osalejal on eraldi arvutiga töökoht. Kodutööde loomisel kasutatakse ainult sotsiaalset tarkvara (OpenOffice, Audacity, Wink, Mozilla Composer). Aktiivselt kasutatakse õpihaldussüsteemi IVA, enamik diskussioone ja tagasisidet toimub IVA vahendeid kasutades.

Kombineeritud õpimeetod:
Kursus koosneb 32 tunnist auditoorsest õppest (tavapärase auditoorse kursuse norm on 48 tundi), enamik auditoorsest tööst toimub arvutiklassis otsese sünkroonse e-õppe keskkonnas. Lisaks on rida muid olulise õpitegevusi läbi viidud IVA keskkonnas.

Õpitulemused ja evalvatsioon:
Eelmisel õppeaastal ei läbinud kursust positiivselt ainult üks 15-st õppijast. Lõpptulemus koosnes: kirjalikust essees (15% lõpphindest), lõpptest (15%), IKT strateegia koostamine oma kooli jaoks (30%), integreeritud e-õppe projekti koostamine, digitaalsete õppematerjalide koostamine ja presenteerimine oma portfoolios (20%).
Õppijatele, kes ei olnud koostanud ja presenteerinud oma e-portfooliot, ei saanud panna kõrgemat hinnet kui „D". Portfoolio koostamine oli oluline osa kursusest, kuivõrd õppijail soovitati seda edasi arendada ka oma edasises koolipraktikas pärast kursuse läbimist.

Lisainfo ja viited:
http://iva.tlu.ee/IVA
kasutajanimi DEMO
parool DEMO

Kontaktandmed:
Sirje Klaos
sirje.klaos@tlu.ee

Projekti kavandamine ja juhtimine (Estonia)

Kursuse nimi:
Projekti kavandamine ja juhtimine

Kool, osakond, riik:
Tallinna ülikool, sotsioloogia osakond, Eesti

Õppeaste, eriala:
Magistritaseme kursus avaliku halduse õppekava raames; avatud kõigile huvilistele (projektijuhtimine on saavutanud suure populaarsuse kõrvalerialana).

Sihtrühm:
Kursus on mõeldud magistrantidele, aga see on avatud ka bakalaureuseastme tudengitele. Teine (ja tavaliselt üsna arvukas) sihtrühm on Avatud ülikooli kliendid, kes saavad kursust võtta täienduskoolitusena. Samuti on kursust pakutud firmadele töötajate sisekoolitusena. Õpperühmad on üldjuhul suured, viimase rühma suuruseks näiteks oli 50 kaugõppe ja 75 päevase õppe tudengit. Kursuse piloteerimisel osales 15 õppijat.

Kirjeldus:
Kursuse eesmärgiks on arendada õppija oskust iseseisvalt ette valmistada, planeerida ja rakendada projekte ja tulenevalt parandada sellega õppija kompetentse tööturul.
Teemad: projekti kontseptsioon, tüübid ja ajalugu; projektipõhise organisatsiooni struktuur; turu-uuring; riskianalüüs; SWOT-maatriks; loogiline maatriks: sisendid, tegevused, väljundid ja eesmärgid ning nende indikaatorid; projekti lühitaotlus ja hindamise meetodid; planeerimine ja plaan: kvaliteedi, aja-, raha-, ja inimressursi planeerimine; ajagraafiku tehnikad: MS Project programmis Gantti graafik ja võrkdiagrammi koostamine; juhtimisplaan; projekti teostamine; projekti lõpetamine: tulemuste analüüs, hinnang, lõpparuande koostamine; projektijuhtimise tarkvara.
Kursusel antakse ülevaade projektitöö eri tahkudest, õppijad saavad praktilise kogemuse projekti koostamiseks ja juhtimiseks enda projekti kirjutamise vormis ja spetsiifilisi projektitöö meetodeid rakendades.
Kursuse eesmärgiks on anda õppijatele oskus projekte kavandada, planeerida ja läbi viia ja sellega suurendada osalejate toimetulekut tööjõuturul.

Pedagoogiline lähenemine:
Kursuse eripära seisneb eelkõige selles, et põhiosa iseseisvast tööst toimub rühmatööna töötubades – IVA võimaldab anda õppejõul mugavalt lisaks individuaalsele hindamisele ka rühmahindeid ja –tagasisidet, lihtsustades sellega oluliselt õppejõu tööd ja kursuse administreerimist.
Rühmatöö pole kasulik kõnealusel kursusel mitte ainult koostööoskusi arendava õppemeetodina, vaid ka õppevaldkonna sisulise eripära tõttu – projektid valmivad koostöös projektigrupi liikmetega ning seetõttu on koostöökogemus praktilises projektitöös sünergia loomiseks äärmiselt oluline. Üliõpilaste tagasiside näitab, et kogu semestri vältel toimuv grupisisene ühistöö on paljudele olnud ainukordne võimalus stuudiumi vältel rühmatööd teha, kuna enamus e- ja lähiõppe kursuseid eeldavad kahjuks vaid individuaaltööd.
Põhiosa õppetööst toimub kollaboratiivse metoodika alusel, rühmatööna 4-6 liikmelistes projektigruppides, mis asuvad IVA töötubades. IVA on väga kasulik projekti dokumentatsiooni haldamiseks ja organiseerimiseks: kaustade loomine, failide üles

laadimine, kustutamine, ümbernimetamine, kopeerimine, liigutamine – kõik on võimalik, et luua süstematiseeritud portfoolio dokumentidest, mida hiljem jälle kasutada.
Kodutööd ja iseseisvad ülesanded on avalikud, et õpilased saaks teineteiselt õppida. Esimese pilootkursuse tagasisides on positiivsena esiletõstetud õppejõu tagasisidest ja parandusettepanekutest saadud abi kodutööde täiendamisel.1-2 korda tuleb hinnata gruppidel ka teiste gruppide töid EL struktuurifondide poolt kasutatava eksperdi hindamislehega. See annab projekti hindamiseksperdi kogemuse, mis tuleb kasuks projektitaotluste kirjutamisel.
Tagasiside viitas kursuse kollaboratiivsete võimaluste positiivsusele – sageli on e-kursused üles ehitatud peamiselt individuaalsetele ülesannetele ja ei anna meeskonnatöö kogemust. Informaalne suhtlemine toimus e-maili ja MSN-i teel või IVA foorumites. Kahjuks ei paku IVA keskkond jututoa võimlaust süsteemi sees.

Kasutatavad tehnoloogiad:
Arvutid, dataprojektor, õpihaldussüsteem IVA, MS project, programm MSP.
Enamik õpitegevusi (suhtlus, esitlused, rühmatöö) toimub õpihaldussüsteemis IVA. Projektijuhtimise vaatepunktist on hea kasutada erinevaid tarkvarasid ja programme diagrammide ja graafikute joonistamiseks.
Projekti plaani koostamine ilma tehnoloogiliste vahenditeta ei ole reaalne.
Projektirühmas töötamise kogemuse saamine, kui partnerid on füüsiliselt kaugel, tehnoloogiliste vahendite abil on väga oluline.

Kombineeritud õpimeetod:
Semestri jooksul toimub viis kontaktpäeva (kohustuslik on osaleda vähemalt kolmel). Iga õppija peab läbi lugema õppematerjali ja omal valikul ühe teose lisaks pakutud kirjanduse loetelust.

Õpitulemused ja evalvatsioon:
Kõik individuaalsed ja rühmatöö ülesanded esitatakse avalikult – nii on kõikidel võimalik üksteise kogemusest õppida. Vähemalt 1-2 korda tuleb hinnata kursusekaaslaste töid. Hindamiseks kasutatakse Euroopa Komisjoni hindamislehti, mis tagab reaalse kogemuse tööks projektidega. Kuna tegemist on väga praktilise kursusega, ei ole kasutusel teste. IVA foorumites osalemist ei hinnata. 70% lõpphindest moodustab esitatud projektikavand; 5% kodutööd (individuaalsed ja rühmatööd) ja umbes 20% lõpphindest saadakse osalemisaktiivsuse põhjal. Teoreetilisi teadmisi hinnatakse projektikavandi suulise esitamise alusel. Praktiliselt kõik osalenud õppijad on kursuse lõpetanud heade lõpptulemustega.

Lisainfo ja viited:
http://iva.htk.tlu.ee/organizer_index
Kasutajanimi AastaKursus05
Parool AastaKursus05

Kontaktandmed:
Sigrid Salla
sigrid.salla@tlu.ee

Õppevahendid kutseõpetuses (Eesti)

Kursuse nimi:
Õppevahendid kutseõpetuses

Kool, osakond, riik:
Tallinna ülikool, Kasvatusteaduste osakond, Eesti

Õppeaste, eriala:
Bakalaureuseastme kohustuslik kursus

Sihtrühm:
2. aasta bakalaureuseastme kutsehariduse pe
dagoogika tudengid. Kursust pakutakse eraldi kahele eri sihtrühmale: tavaõppe ja kaugõppe tudengitele. Viimase rühma moodustavad tavapäraselt praktilise kutseõpetaja kogemusega õppijad, kes vajavad täiendõpet pedagoogilise hariduse tõendamiseks. Keskmine õpperühm on 25-30 õppijat. Bakalaureusetaseme tudengitele on see kohustuslik kursus, teiste teaduskondade tudengid saavad kursust võtta valikainena.

Kirjeldus:
Kursusel käsitletakse järgmisi teemasid: üldandmed õppevahenditest, õpetamise tehnovahendid, dünaamilisust tagavad tehnovahendid, õppetehniline dokumentatsioon, õppetekstid, probleemülesanded, õpiedukustestid, enesehindamise testid, erialased ristsõnad, erialased esitlused, audioloeng, õpimapp, õppevahendite kasutamine õppeprotsessis, õppekirjanduse publitseerimine, auoriõigused (sh. Creative Commons litsentsi kasutamine).

Pedagoogiline lähenemine:
Konkreetselt defineeritud pedagoogilist lähenemist ei ole, üldiseks põhimõtteks on liikumine kergemalt keerulisemale (nii teemade siseselt kui praktiliste oskuste omandamiseks mõeldud praktikumides).

Kasutatavad tehnoloogiad:
Peamiselt on kasutusel vabavaralised tehnoloogiad:

- Acrobat Reader
- HotPotatoes
- Audacity
- eFormular
- Õpihaldusssteem IVA

Kombineeritud õpimeetod:
Keskmiselt 50% ajast toimub õpe elektroonilises IVA keskkonnas. Umbes 25% kursusest viiakse läbi auditoorse õppena, mis omakorda on jaotatud loengute, iseseisvate ülesannete ja rühmatööde vahel (arvutiklassis).

Õpitulemused ja evalvatsioon:
Õppurite tagasisidest lähtuvalt meeldis neile just see, et õpiti tundma ja kasutama erinevaid vabavara programme, mida nemad omakorda oma õppetundide ettevalmistamiseks ja läbiviimiseks kasutada saavad. Samuti märgiti suure plussina ära kiire tagasiside ning võimalu õppejõuga alati kontakteeruda.

Lisainfo ja viited:
http://www.tlu.ee/~heidi/HotPot
http://www.tlu.ee/~heidi/Audacity

Kontaktandmed:
Heidi Paju
heidi.paju@tlu.ee

Dünaamiliste süsteemide füüsika (Portugal)

Kursuse nimi:
Dünaamiliste süsteemide füüsika

Kool, osakond, riik:
Porto Ülikool, Inseneriteaduskond, Portugal

Õppeaste, eriala:
Bakalaureuseõpe; füüsika ja matemaatika eriala üliõpilased

Sihtrühm:
2. aasta informaatika ja arvutiteaduse üliõpilaste põhikursus.

Kirjeldus:
Dünaamiliste süsteemidega tutvumine; mittelineaarsed dünaamikad, võnkumised, korrapäratu liikumine ja fraktaalid; arvutipõhise Algebra Süsteemi kasutama õppimine (CAS).
Õppijaid: 120
Õpetajaid: 2 (Jaime Villate ja João Carvalho)
Tuutoreid: 0

- 2 loengut ja 2-tunnine praktikum nädalas
- Füüsikalised teemad: mittelineaarne dünaamika, korrapäratu liikumine ja fraktaalid.
- Praktiline lähenemine arvutite abil
- Õpihaldussüsteem: Moodle
- Arvutipõhine Algebra Süsteem (CAS): Maxima

Pedagoogiline lähenemine:
Aktiivse osalemisega juhendamissessioonid arvutiklassis. Kursus toimub veebipõhiselt Moodle süsteemis. Koosneb eri menüüdest ja blokkidest. Kursuse sisu ja tegevused on organiseeritud sektsioonidena põhibloki sees.

Kasutatavad tehnoloogiad:
Õpihaldussüsteem Moodle, kasutatakse:

- foorumeid
- jututuba
- ülesannete vahendit
- küsitlusi
- sõnastikku ja

CAS tarkvara (Maxima), toetamaks loengutega paralleelselt toimuvaid tegevusi ja praktilisi töid arvutiklassis.

Kombineeritud õpimeetod:
12 iganädalast praktikumi 12-liikmelises rühmas, olemas arvuti iga kahe üliõpilase kohta. Õppijatele esitatakse juhendid ja ülesanded Moodle keskkonnas. Tudengid kasutavad Maxima tarkvara esitatud ülesannete lahendamiseks ja iga sessiooni lõpus postitatakse tulemused Moodle keskkonda. Õppejõud annavad tagasiside e-posti vahendusel ja see salvestub automaatselt ka Moodle keskkonnas.

Õpitulemused ja evalvatsioon:
Õpitulemused paranesid märgatavalt kombineeritud kursuse kasutuselevõtu järel (eelnevalt auditoorses vormis kursus Klassikaline mehhaanika 2001./2002. õppeaastal). Kursuselt puudujate osakaal vähenes 34%-lt 14 %-le, kursuse sooritanute osakaal tõusis 43%-lt 94%-le ja kursusel aktiivselt osalenute ent lõppeksamil läbipõrunute osakaal langes 47%-lt 13%-le.
Samuti suurenes üldine osalejate hulk, mis näitab kursuse suurenenud atraktiivsust. Kursuse kombineeritud versiooni on saanud Porto Ülikooli esimese e-õppe „Excellence Award" auhinna.

Lisainfo ja viited:
Kursuse veebilehekülg õpihaldussüsteemis Moodle:
http://moodle.fe.up.pt/2005/course/view.php?id=12

Kursuse veebileht (Porto Ülikooli õppeinfosüsteem SiFEUP):
http://www.fe.up.pt/si/Disciplinas_geral.FormView?P_ANO_LECTIVO=2005/2006&P_CAD_CODIGO=EIC2107&P_PERIODO=1S

Artiklid ja viited:
http://fisica.fe.up.pt/pub/villate/b-learn/b-learn_villate.pdf
http://www.fe.up.pt/si_uk/PUBLS_PESQUISA.FORMVIEW?p_id=11634&p_tipo=Relat

Kursuse materjalid:
J. E. Villate, Introdução aos Sistemas Dinâmicos, edição do autor, 2005. ISBN: 972-99396-0-8

Kontaktandmed:
Jaime Villate
villate@fe.up.pt
http://www.villate.org/ või http://www.fe.up.pt/si/funcionarios_geral.FormView?P_CODIGO=211847

Valik detailsemaid kursusekirjeldusi

KURSUSE KIRJELDUS

Kursuse nimi:
Publitseerimine Internetis

Ülikool, osakond, riik:
Sør-Trøndelagi Ülikooli Kolledž, Informaatika ja e-õppe osakond, Norra (Õppejõud: Svend Andreas Horgen)

Keel:
Norra keeles

Teadusvaldkond:
Informaatika

Õppeaste:
Sissejuhatav kursus, bakalaureuseaste

Kursuse tüüp:
Loengud ja laboratoorsed tööd

Kursuse kirjeldus:
Internetitehnoloogiate algkursus HTML and JavaScripti tutvustamiseks, üldine ülevaade veebitehnoloogiatest

Kursuse materjalid:
Loengumaterjalid, internetimaterjalid (näiteks Sams each yourself HTML in 24 hours)

Lisamaterjalid:
Valikvastustega testid, harjutused

Kursuse veebileht:
https://www.itslearning.com/ site: Høgskolen i Sør-Trøndelag.
Kasutajanimi: svendhorg
Parool: Blearn123
Kursuse nimi: Publisering på Internett 07V.

Õppijaid:
30

Õppejõude:
2

Tuutoreid:
0

PEDAGOOGIKA

Õpieesmärgid:
Osata luua veebilehti ja mõista selleks vajalikke põhitehnoloogiaid

Pedagoogiline lähenemine:
Peamiselt iseseisev töö, auditoorne õpe ja praktilised ülesanded. Kombineeritud õpe seisneb kollaboratiivse õppe elementide sidumises auditoorse kursusega. Algselt oli kursus ülesehitatud sissejuhatava auditoorse loengu (2 tundi) ja õppijate iseseisva harjutuse (vajadusel juhendaja kaasabi) kombinatsioonile. Edasiarendatud versiooni puhul on auditoorne õpe muudetud praktilist laadi tegevusteks (3-3,5 tundi) lisanduvate integreeritud tegevustega (kirjeldatud allpool).

Innovaatilised elemendid:
Podcast ja tehnoloogilised vahendid (sünkroonne tegevus õpihaldussüsteemis) õppijate suurema aktiivsuse ja motivatsiooni tagamiseks. Lisanduvad kaksikloengud (loeng kahel paralleelsel teemal kahe õppejõu esituses ühe loengutunni raames)

Pedagoogikaalased viited:

TEHNOLOOGIA

Kasutatavad tehnoloogiad:
Õpihaldussüsteem

Tehnoloogia kasutamise kirjeldus:
Vt allpool. Vajalik kõikide õppijate juurdepääs arvutile, õppijad kuulavad lindistatud ülekandeid (Podcaste).

Tehnoloogiliste vahendite kasutamise põhjendus:
Digitaalsed lahendused võimaldavad õppejõul efektiivsemalt suhelda oma tudengitega. Õppijal on lihtsam olulisi küsimusi esitada, kui nad saavad eelnevalt küsimuse püstituse osas järele mõelda (auditoorse õppevormi puhul ei ole selline viiteaeg nii lihtsalt võimalik), esitada see foorumi vm õpihaldussüsteemi vahendi abil ja saada õppejõult kohene vastus. See on innovaatiline element õpetamises ja ei tekita ilmtingimata õppijatevahelist ja õppejõu ja õppijavahelist eraldatusetunnet. Podcasti kasutamine on innovaatiline meetod, aga ei oma olulist erinevust võrreldes tekstilise veebimaterjaliga. Samas on see hea vahend tutvustamaks õppijaid olemasolevate uudistevõimalustega internetis. See innustab õppijaid kasutama kvaliteetuudiste Podcaste näiteks tavapärase muusikakuulamise asemel (bussis, tänaval jne).

KOMBINEERITUD ÕPIMEETOD

Detailne kirjeldus:
E-õppe vahendid on kasutusele võetud õppija aktiivse osalemise suurendamiseks. Auditoorsete loengute asemel toimuvad kohapealsed tegevused arvutiklassis. Selline korraldus võimaldab operatiivselt liikuda teoreetiliste loenguosade ja praktiliste harjutuste vahel. Õpihaldussüsteem on kasutusel ennekõike õppijatele kombineeritud õppe kogemuse andmiseks. Järgnevalt on esitatud lühike loetelu kursusel kasutusel olevatest tegevustest:

- Hindamislehed.
- Küsitluslehed enne teoreetilise osa algust. Tulemusena saavutatakse õppija parem haakumine õppeteemaga ja õppijad omandavad loengu jooksul rohkem teadmisi.
- Teoreetiline ülevaade, 15-20 minutit.
- Valikvastustega küsimustik või muu praktiline ülesanne, võimalik ka õpihaldussüsteemi vahendusel.
- Järgmine teoreetiline osa, 15-20 minutit.
- 20-minutiline paus, millele eelneb küsitlusleht loengumaterjalide kohta. Õppejõul on võimalik operatiivselt saada tagasisidet vääralt omandatud kontseptsioonide ja lünkade kohta teadmistes.
- Sarnasel põhimõttel on üles ehitatud kogu kursus. Samuti on rakendatud kaksikloengut, kus kaks õppejõudu (Svend Andreas Horgen ja Per Borgesen) käsitlevad erinevaid teemasid paralleelselt ja dialoogis õppijatega. Sellise lähenemise tulemusel saavutatakse õppijate oluliselt kõrgem motivatsioon õppematerjali omandamiseks. Sarnased kaksikloengud toimusid kursuse esimese ja viimase loenguna.

Kasutati ka Podcasti: veebist valitud sobiv Podcasti fail laeti alla, kuulati loengu käigus 5-10 minutit ja seejärel toimus arutelu väikestes rühmades 5-10 minutit (sisu ja suhestamine teooriaga) + kokkuvõte 5-10 minutit.

Palun kirjeldage...
1. Kuidas on kursuse sisu esitatud (kui võimalik, siis esitada ka osakaalud)
☒ Auditoorsed loengud.....%
☒ PowerPoint esitlused.....%
☒ Elektroonilised materjalid veebis, õpihalduskeskkond, täistekstid ja/või slaidid.....%
☐ Videostriiming, videoloengute salvestused, videokonverentsid.....%
☐ Audiostriiming, audioloengute salvestused.....%
☐ Animatsioonid.....%
☒ Graafikud, illustratiivsed tabelid ja pildid .....%
☐ Integreeritud lahendused (nt slaidid kombineeritud audio/video materjalidega) .....%
☐ CD, DVD.....%
☒ Muu: Podcast, valikvastustega küsimustikud

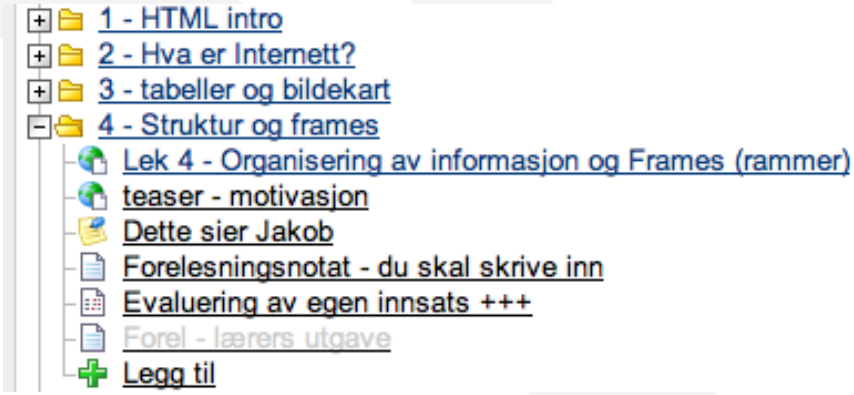
2. Millised kursuse osad on läbi viidud veebipõhiselt:
☒ Suhtlemine
☐ Rühmatööd
☐ Õpijuhis
☒ Kursuse sisu

☒ Tagasiside andmine, tehniline tugi, kursuse organisatoorne abi
☒ Kursuse korraldusega seotud info (kontakt, läbimise nõuded, oodatavad õpitulemused, jm)
☒ Tööde hindamine
☐ Hindamine
☐ Testid
☒ Enesetestid
☒ Enesehindamine
☐ Lisamaterjalid

ÕPIPROTSESSI KIRJELDUS

Palun loetlege õppemeetodid ja nende kasutamise järjekord kursusel;
Palun kirjeldage detailsemalt 2-3 peamist tegevust (meetodit).

Detailne kirjeldus on esitatud ülal. Lisaks siinkohal üks illustratiivne juhtumikirjeldus:



Joonisel on tüüpiline selle kursuse raames toimuv kombineeritud õppe sessioon: alguses loevad tudengid enne loengu toimumist pika tekstilise materjali ja saavad seejärel vastava teoreetilise osa kohta osalemismotivatsiooni tagava ülesande. See on üldjuhul veebilink teemaga seonduvale artiklile. Märkus “Dette sier Jakob” on mingi tekst (selles näites Jakob Nielsen tutvub uuringuga, mille tulemused näitavad, et inimesel kulub uue veebilehe esmamulje omandamiseks 50 millisekundit. Järgneb PowerPoint materjal, milles on osa informatsiooni kustutatud. Õppija ülesanne on lüngad sobiva informatsiooniga täita. Auditoorse töö käigus näitab õppejõud terviklikku esitluse teksti, lisades aktiveerimiseks näiteid, ülesandeid, nalju, võimalusel ka Podcasti faili. Lõpuks on õppijatel võimalik enda tööle hinnang anda.
Loodetavad õpitulemused:
Suurenenud õppija aktiivsus ja arusaamine materjalidest, õppimise ja suhtlemise võimaldamine.
Juhendid: Ei ole vajalikud, piisab suulisest juhendamisest enne iga tegevuse algust.

Õppijate hindamine , lõpphinne moodustub järgmistest elementidest (osakaal):

- Aktiivne osalemine kursusel (nii auditoorne kui veebipõhine õpe) .....%
- Osalemine foorumidiskussioonides.....%
- Osalemine seminaridel.....%
- Iseseisvate tööde läbimine.....%
- Rühmatööde läbimine .....%
- Testide tulemused.....%
- Osalemine kontaktpäevadel.....%
- Eksam/arvestus.....%

EVALVATSIOONI TULEMUSED

Informaalne hindamine on näidanud, et tudengitele sobib selline õppimisvorm. Positiivne on ka see, et õppijad ei jää ühest loengust puudumise tõttu õpperühma tegevustest maha, vaid saavad kogu materjali omandada ja tegevused sooritada veebipõhiselt õpihaldussüsteemi võimalusi kasutades.

KONTAKTINFORMATSIOON

Lingid, lisainfo

http://www.aitel.hist.no/~svendah/FoU/PPT/horgen-blended-learning-steinkjer-oktober-2006.ppt (norra keeles)

Kontaktandmed:

Svend Andreas Horgen, svend.horgen@hist.no, http://aitel.hist.no/~svendah and http://gjemmesiden.blogspot.com

KURSUSE KIRJELDUS

Kursuse nimi:
IKT vahendid hariduses (magistriprogramm)

Ülikool, osakond, riik:
Stord/Haugesund Ülikooli Kolledž, Haridusteaduse osakond, Norra

Ainepunkte:
120

Keel:
Norra keel

Õppevaldkond:
Haridusteadus ja IKT

Õppeaste:
Magistriõpe

Kursuse tüüp:
Auditoorsed ja veebipõhised loengud; praktiline IKT-laboratoorium; projektid

Kontekst:
Magistriõpe, IKT vahendite rakendamine ja integreerimine hariduses

Sihtrühm:
Õpetajakoolituse üliõpilased, õpetajad ja IKT-põhiste õpisüsteemide arendajad

Kursuse kirjeldus:
Kursuse keskseks teemaks on IKT vahendite kasutamine ja integreerimine õppetöösse. Õppe tagapõhi on küll pedagoogikas, aga see ei ole kursus õppemeetoditest JA pedagoogikast eraldiseisvaina. Õppetöö baseerub sarnastel kursustel mujal maailmas. Kursus moodustab õpetajakoolituse tudengite neljanda ja viienda aasta programmi ja lõpeb õpetajakutse ja magistrikraadiga (IKT hariduses)

Programm moodustub (2006) kaheksast kursusest kahe õppeaasta jooksul

- Õppematerjalid (10 AP)
- E-õpe (20 AP)
- Arendustöö (töö materjalide loomiseks) (20 AP)
- Õpiteooriad (10 AP)
- Uurimismeetodid (10 AP)
- Andmete kogumine/otsing ja avaldamine (10 AP)

- Didaktiline uurimus (10 AP)
- Magistritöö kirjutamine (30 AP)

Kursuse materjalid:

Alessi, S. M. & Trollip, S. R. (2001). Multimedia for learning - Methods and development. Needham Heights, Massachusetts: Allyn & Bacon

Bing, J. (2000). Menneskers verk - om åndsverk, opphavsrett og kopiering. Oslo: Universitetet i Oslo, Institutt for rettsinformatikk. http://www.kopinor.no/opphavsrett/artikler_og_foredrag/menneskers_verk

Kristensen, T. (2000). Informasjon, kommunikasjon og teknologi. Oslo: Cappelen akademisk forlag

Atherton, J. S. (2003). Learning and Teaching: Learning index. [Online]. http://www.learningandteaching.info/

Salomon, G. & Dekel, A. (2004). An e-learning course on LEARNING. Nettressurs HSH

Dysthe, O. & Engelsen, K. S. (red.) (2003) Mapper som pedagogisk redskap. Perspektiver og erfaringer.
Oslo: Abstrakt Forlag.

Jonassen, D. H., Carr, C., Yeuh, H-P. (1998): Computers as Mindtools for Engaging Learners in Critical Thinking. (Paper på Tech-Trends, mars 1998) http://tiger.coe.missouri.edu/~jonassen/Mindtools.pdf

Salmon, G. (2002) E-tivities: The Key to Active Online Learning. London: Kogan Page.

Sigmundson, H. & Bostad, F. (red.). (2004). Læring: grunnbok i læring, teknologi og samfunn. Oslo: Universitetsforlaget
Bertheussen, B. (2002). Visual Basic.NET i teori og praksis. Tromsø: EDB kunnskap.

Minken, I. & Stenseth, B. (1992). Brukerorientert Programdesign. Oslo: Kirke-, utdannings- og forskningsdepartementet
Ask, F. F. (1998). Elementær statistikk. En pedagogisk innføring. Grimstad: Unikurs.

Kvale, S. (2001). Det kvalitative forskningsintervju. Oslo: Gyldendal Akademiske.

Patel, R. & Davidson, B. (1995). Forskningsmetodikkens grunnlag : å planlegge, gjennomføre og rapportere en undersøkelse. Oslo: Universitetsforlaget.

Patton, M. Q. (1987). How to use qualitative methods in evaluation. Thousand Oaks, London, New Dehli: SAGE Publications Ltd.

Tiller, T. (1999). Aksjonslæring. Forskende partnerskap i skolen. Kristiansand: Høyskoleforlaget.

Torgersen, G.-E. & Vavik, L. (2004). Forskningsmetode i IKT-pedagogikk : om å drive FoU i pedagogisk bruk av IKT : en studie- og aktivitetsbok for lærere og ledere i skole og opplæring. Stjørdal: Læringsforlaget.

Yin, R. K. (1994). Case Study Research. Design and Methods. Thousand Oaks, London, New Dehli: SAGE Publications Ltd.
Access 2003. Steinkjer: DataPower.

Rob, P. (2002). Database systems : design, implementation, and management. Cambridge, Mass: Thompson Learning.

Torgersen, G.-E. & Vavik, L. (2004). Forskningsmetode i IKT-pedagogikk : om å drive FoU i pedagogisk bruk av IKT : en studie- og aktivitetsbok for lærere og ledere i skole og opplæring. Stjørdal: Læringsforlaget

Lorentzen, S., Streitlien, Å., Tarrou, A.-L. H. og Aase, L. (1998). Innføring i fagdidaktikkens forutsetninger og utvikling. Oslo: Universitetsforlaget.

Schnack, K. (Red.). (2004). Didaktik på kryds og tværs. København: Danmarks Pædagogiske Universitets Forlag.

Schnack, K. & Kristensen, H. J. (Red.). (2000). Faglighed og undervisning. København: Gyldendal

Lisamaterjalid:
Veebipõhised õppematerjalid

Kursuse veebileht:
http://stud.hsh.no/lu/inf/master/
Vajalik eelnev õpihaldussüsteemi (Fronter) pealehelt sisenemine

Tudengeid:
40

Õppejõude:
7

Tuutoreid:
6

PEDAGOOGIKA

Õpieesmärgid:
Õppijad omandavad teoreetilised teadmised, tehnoloogia- ja metoodikaalased oskused digitaalsete vahendite kasutamiseks õppetöös. Keskne õpieesmärk on IKT-vahendite integratsioon hariduses.

Pedagoogiline lähenemine:
Rakendatakse järgmisi teooriaid ja mudeleid:

- Kollaboratiivne ja konstruktivistlik õpetamine
- Probleemipõhine õpe

- Projektipõhine õpe

Kõiki teooriaid rakendatakse nii päevase kui ka kaugõppe vormis õppivatele rühmadele.
Kursusel kasutatakse:

- Auditoorset õpet ja tuutoreid
- Veebipõhist juhendamist
- Kohustuslikke seminare, mille käigus õppijad kohtuvad näost näkku ülikooli kolledži ruumides (võimalik korraldada seminare ka videokonverentsi vormis).

Innovaatilised elemendid:
Päevase ja kaugõppe tudengite õppetöö ühendamine sama kombineeritud kursuse raames on oluline innovaatiline element. Samuti on uudne sünkroonse ja salvestatud videomaterjali kasutamine. Laialdane sotsiaalkonstruktivistliku lähenemise rakendamine on õppijate jaoks samuti uudne lähenemine.

Pedagoogikaalased viited:

TEHNOLOOGILISED LAHENDUSED

Kasutatavad tehnoloogiad:
Kursus on mõeldud nii päevaste kui ka kaugõppe üliõpilaste jaoks. Tagamaks mõlema õpperühma jaoks sobivat programmi, kasutatakse kursuse läbiviimiseks suures osas interneti ja õpihalduskeskkonna võimalusi. Veebipõhiselt on läbi viidud järgmised tegevused:

- Materjalide levitamine
- Videomaterjalide levitamine (nii sünkroonne kui ka asünkroonne)
- Suhtlemine (õpetaja ja õppija vahel ja õppijad omavahel)
  - Asünkroonne kommunikatsioon
  - Juhendid
- Koostöö ja ühisõpe

Tehnoloogiliste vahendite kasutamise kirjeldus:
Tehnoloogia kasutamine on kohandatud samaaegselt rahuldama päevases ja kaugõppe vormis õppivate tudengite vajadusi.

Innovaatilised elemendid:
Sünkroonse ja salvestatud videomaterjali kasutamine muudab kursuse õppija vajadustele paremini vastavaks. Innovaatiliseks saab pidada ka tehnoloogilisi koostöövahendeid.

KOMBINEERITUD ÕPIMEETOD

Detailne kirjeldus:
Detailne kirjeldus kombineerimise sisu osas; kuidas on ühendatud auditoorne ja veebipõhine õpe.

Auditoorne õppetöö moodustab suhteliselt väikese osa programmist. Samuti on osa auditoorselt esitatud infost edastatud videokonverentsi vahendite abil.
Juhendamine toimub vastavalt tudengite asukohale.
Päevase õppe tudengitel on võimalik saada juhendamist auditoorses vormis, kaugõppes õppijate puhul kasutatakse juhendamiseks e-maili, õpihaldussüsteemi, sünkroonse kommunikatsiooni vahendeid (MNS) ja asünkroonseid kommunikatsioonivahendeid (diskusioonifoorumid). Kogemus näitab, et ka päevase õppe tudengid soovivad õppimiseks ja suhtlemiseks kasutada suures osas samasid vahendeid. Suhtlemine õppijate vahel rühmades, kuhu kuulub nii kohapeal kui kaugõppe õppivaid tudengeid, on samuti korraldatud sünkroonsete ja asünkroonsete diskussioonivahendite abil.

Palun kirjeldage...
1. Kuidas on kursuse sisu esitatud (kui võimalik, siis esitada ka osakaalud)
☒ Auditoorsed loengud.....%
☒ PowerPoint esitlused.....%
☒ Elektroonilised materjalid veebis, õpihalduskeskkond, täistekstid ja/või slaidid.....%
☒ Videostriiming, videoloengute salvestused, videokonverentsid.....%
☐ Audiostriiming, audioloengute salvestused.....%
☐ Animatsioonid.....%
☒ Graafikud, illustratiivsed tabelid ja pildid .....%
☐ Integreeritud lahendused (nt slaidid kombineeritud audio/video materjalidega) .....%
☐ CD, DVD.....%
☐ Muu: ....

2. Millised kursuse osad on läbi viidud veebipõhiselt:
☒ Suhtlemine
☒ Rühmatööd
☒ Õpijuhis
☒ Kursuse sisu
☒ Tagasiside andmine, tehniline tugi, kursuse organisatoorne abi
☒ Kursuse korraldusega seotud info (kontakt, läbimise nõuded, oodatavad õpitulemused, jm)
☒ Tööde hindamine
☒ Hindamine
☐ Testid
☐ Enesetestid
☐ Enesehindamine
☐ Lisamaterjalid

ÕPPEPROTSESSI KIRJELDUS

Palun loetlege õppemeetodid ja nende kasutamise järjekord kursusel.
- Õppijatel on õpetajakoolituse-alased algoskused olemas bakalaureusetaseme õppetööst. Magistriõppes keskendutakse teaduslikele meetoditele, valmistudes teadustööks ja magistritöö kirjutamiseks.
- Praktiline ja teoreetiline IKT-vahendite integratsioon õppemeetoditesse
- Magistritöö teema valimine

Õppijate hindamine (lõpphinne moodustub järgmistest elementidest (osakaal)):
☒ Aktiivne osalemine kursusel (nii auditoorne kui veebipõhine õpe) .....%
☒ Osalemine foorumidiskussioonides.....%
☒ Osalemine seminaridel.....%
☒ Iseseisvate tööde läbimine.....%
☒ Rühmatööde läbimine .....%
☐ Testide tulemused.....%
☐ Osalemine kontaktpäevadel.....%
☐ Eksam/arvestus.....%

EVALVATSIOONI TULEMUSED

Praeguseks on programmi läbinud 20 tudengit, õpitulemused on olnud head. Õppijate tagasiside (veebipõhine küsitlusvorm) on olnud positiivne, aga vajalikuks on peetud õpisisu, meetodite ja tehnoloogiliste vahendite arendamist. Edasiarendatud versioon magistriprogrammist käivitus 2007. aasta augustis.

KONTAKTINFORMATSIOON

Lisainfo veebis
http://stud.hsh.no/lu/inf/master/ (norra keeles)
http://www.hsh.no/english/ICT_in_Learning.pdf (inglise keeles)

Kontaktandmed:
Jostein Tvedte
jostein.tvedte@hsh.no
+47 53 49 13 78

KURSUSE KIRJELDUS

Kursuse nimi:
Globaalne keskkond ja areng – Arenguriigid

Ülikool, osakond, riik:
AAgderi Ülikooli Kolledž, Majanduse ja sotsiaalteaduste teaduskond, Arengu-uuringute instituut, Norra

Ainepunkte:
7 1/2

Keel:
Inglise keel

Õppevaldkond:
Keskkond

Õppeaste:
Magistriõpe

Kursuse tüüp:
Kollaboratiivne veebipõhine õpe praktikakogukonnana

Kursuse Kirjeldus:
Õpieesmärgid
Programmi eesmärk on tutvustada arengu- ja keskkonnateooriaid ja uurimistulemusi ning sobivaid juhtimisvahendeid praktiliste küsimustega tegelemiseks. Õppijad saavad ülevaate globaalsest keskkonnaolukorrast, analüüsivad keskkonnategurite ja majandusarengu suhteid keskkonnahoiu seisukohalt ja kujundavad arusaamad jätkusuutliku arengu olemusest. Programmi põhirõhk on globaalsetel arengutel, aga ülevaade saadakse ka regionaalsetest prioriteetidest. Kursusel esitatakse alternatiivseid võimalusi arenguküsimustega tegelemisel, sh eetika ja isikliku suhestumise vaatepunktidest. Õppijatele tagatakse õpikeskkonna ja protseduuridega seonduv tugi, kõigil osalejatel on võimalus isiklike õpioskuste arendamiseks.

Kursuse eesmärgid

Programmi läbimise järel oskavad tudengid:

- Kirjeldada, arutleda globaalse keskkonna teemadel ja esitada peamisi probleemseid küsimusi järgmiste teemadega seonduvalt: kasvuhooneefekt, klimaatilised muutused, bioloogiline mitmekesisus, juurdepääs puhtale veele, osooniaugud, saastetegurid, eutrofeerumine.
- Veebipõhistes diskussioonides ja esseede vormis analüüsida ja seletada peamisi regionaalseid keskkonnaprobleeme.

- Veebipõhistes diskussioonides arutleda ja hinnata keskkonnahindamise protsesse.
- Veebipõhistes diskussioonides, lühiloengute ja esseede vormis võrrelda, analüüsida ja hinnata keskkonna ja arenguküsimuste omavahelisi seoseid eri osalejate vaatenurkadest.
- Erinevaid ökoloogilisi termineid ja meetodeid rakendades arutleda keskkonnategurite omavahelise seotuse küsimusi ja peamisi stsenaariume.

Osalejad omandavad järgmised oskused:

- Konstruktiivselt uurida eri poliitikate ja tegevuste mõju keskkonnale;
- Arengustsenaariumitele tuginedes teha strateegilisi otsuseid;
- Teha meeskonnatööd nii füüsiliste kui virtuaalsete rühmadena ideede jagamiseks, probleemide analüüsimiseks ja lahenduste leidmiseks;
- Hinnata ja kokku võtta erinevaid argumente;
- Tasakaalustada ja integreerida eri vaatenurki otsustusprotsessi käigus;
- Esitada akadeemilises vormis uurimustöid;
- Vahetada keskkonnaalast informatsiooni;
- Hinnata isiklikku õppeprotsessi ja õpioskuste arengut.

Õppijad peaksid omandama selgema suhtumise järgmistesse küsimustesse:

- Keskkonna- ja arenguprotsesse mõjutavad väärtused ja eetilised perspektiivid ja nende esitamine struktureeritud presentatsiooni vormis.

Moodul 1: Taustainformatsioon.
Rõhumuutused teeäärselt prügilt pestitsiidide kasutamise, globaalse soojenemise, osoonikihi muudatuste, biodiversiteedi ja GMOde suunas; keskkonnapoliitika muutumine ajaloo, poliitikate ja tegevuste taustal.

Moodul 2: Keskkonnaolukord
Ülevaade globaalse keskkonna olukorrast, hindamisprotsessist ja regionaalsetest arengutest. Peamised küsimused keskkonnahindamises ja keskkonnamuutustes viimastel kümnenditel.

Moodul 3: Haavatavused, riskianalüüs ja adaptatsioon
Inimkeskkonna haavatus keskkonnamuutustele, riskide hindamise moodused ja haavatavuse vähendamine.

Moodul 4: Mõjutajad ja stsenaariumid
Stsenaariumite analüüsimise tutvustus, kuidas otsused ja poliitikamuutused kujundavad tulevikuarengud. Peamised keskkonnamuutusi põhjustavad tegurid.

Moodul 5: Jätkusuutliku arengu saavutamine?
Vahendid jätkusuutliku keskkonnaalase arengu tugevdamiseks ja edendamiseks. Poliitikate monitoorimine, rahvusvahelised suhted, äriettevõtete ja tehnoloogia kaasamine jätkusuutliku arengu tagamise protsessi. Ennustused ja stsenaariumid.

Kursuse materjalid:
Õpijuhis.

Global Environment Outlook 3. UNEP Earthscan, UK 2002.

Geo yearbook: an overview of our changing environment 2004/05 UNEP

Nellemann et al. (2004): The fall of the water. UNEP

EarthCouncil Learning Center. Bjorke (2004): Greenhouse effect and Climate Change
http://www.earthcouncil.com/earthcouncil/

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http://www.maweb.org//en/Products.Synthesis.aspx

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http://www.grida.no/gvugeo/aicc/Timeline/003.htm

Speth, G: "Recycling Environmentalism", U.S. Council on Environmental Quality 2002
http://www.creationethics.org/index.cfm?fuseaction=webpage&page_id=187

UN Millennium Declaration. General Assembly Sept. 2000
http://www.un.org/millennium/declaration/ares552e.pdf

Online ja CD-ROMil: learning resources library with articles, videos, veebiviited jms
http://gvu.unu.edu/resources.htm

Lisamaterjalid:
CD-ROM juhendite ja kusruse materjalidega Kliimamuutuste jm teemadel

Kursuse veebileht:

Tudengeid:
24

Õppejõude:
1

Tuutoreid:
1

PEDAGOOGIKA

Õpieesmärgid:
Vt Kirjeldus

Pedagoogiline lähenemine:
Peamiselt sotsiaalkonstruktivistlik kollaboratiivne õppimine praktikakogukondadena

Innovaatilised elemendid:
Innovaatiline pedagoogiline lähenemine – kollaboratiivse õppimise ja iseseisva õppeprotsessi kombinatsioon.
Kvaliteedikontrolliga õpikeskkond

Pedagoogikaalased viited:
http://gvu.unu.edu/prog.cfm?pageid=1037&programid=101&courseid=1024

TEHNOLOOGIAD

Kasutatavad tehnoloogiad:
Õpihaldussüsteem Fronter, Internet, e-mail

Tehnoloogiliste vahendite kasutamise kirjeldus:
Virtuaalne õpperuum ja rühmatööruumid veebipõhiste konverentside korraldamiseks ja praktikakogukondade kujundamiseks.

Õigustus tehnoloogia kasutamiseks:
Füüsiliselt maailma eri paigus asuvate õppijate ühendamine virtuaalseks kogukonnaks. Peamiseks eeltingimuseks on internetiühenduse olemasolu

Innovaatilised elemendid:
Füüsiliselt maailma eri paigus asuvate õppijate ühendamine virtuaalseks praktikakogukonnaks

KOMBINEERITUD ÕPIMEETOD

Detailne kirjeldus:
Kogemus näitab, et kombineeritud kursus, mille puhul veebipõhisele õppele eelneb õppijate ja õppejõudude füüsilise kohalolekuga auditoorne sessioon, omab olulisi eeliseid. Kaugõppe puhul on väljalangemise protsent üldjuhul kõrge, enam kui 50%-line väljalangevus on üsna tavaline nähtus (Simpson,2002, lk.9). Kaugõppe vormis õppimine tähendab tavaliselt isoleeritud õpiprotsessi ja õppijaid, kes ei suuda toetavat võrgustikku luua, ähvardab kursuse pooleli jätmine enim. Põhjuseks siin on suuresti asjaolu, et igasugune õppimine on dialoogiprotsess (Simpson,2002,lk.10).
Auditoorne sissejuhatav sessioon enne kahe aasta pikkust õppeprogrammi tekitab grupiidentiteedi ja tagab vajaliku võrgustiku olemasolu ja tulemusena suureneb ka motivatsioon, veebipõhine koostegevus ning õpikeskkond muutub avatumaks ja

empaatilisemaks. Need loetletud tegurid määravad ka õppija pikaajalise suhte kursusega.

Osalejad

Osalejad on peamiselt Põhja-Euroopast ja Aafrika riikidest. Tulevikus ühinevad ilmselt ka Aasia tudengid. Osadel õppijatel (nt enamikul norralastel) on osalemine kursusel tasuta ning olemas lihtne juurdepääs internetile. Enamikul neist on olemas eelnev kogemus kollaboratiivse õppimise metoodika kasutamisest ja üldjuhul ka valitud õpihaldussüsteemi (Classfronter) kasutamisest. Osa päevase õppe tudengitest omab tänu oma asukohale ka igapäevast võimalust õppejõududega kohtumiseks. Norra ülikooli juures õppivatel tudengitel on sageli keerulisem luua virtuaalses keskkonnas ja uudse õppemetoodikaga kursustel toimivat võrgustikku. Aafrika päritolu õppijate jaoks on osalemine kindlasti mõnes mõttes veelgi keerulisem. Nende juurdepääsuvõimlaused internetile on üldjuhul viletsad, tasuta võimalus võib üldse puududa; samuti puudub toetav võrgustik nagu see on olemas norralastel. Samas on ühine osalemine veebipõhistes rühmatöödes kohustuslik kõikidele kursusest osavõtjaile. Koostöö edukuse puhul on määravateks teguriteks ebavõrdsest internetile juurdepääsust, erinevatest kultuurilistest taustadest, ebaühtlasest keeleoskusest ja erinevatest õpikogemustest tingitud takistuste ületamine. Just sellepärast ongi oluline kahenädalase auditoorse sessiooni korraldamine Norras.

Auditoorse õppetsükli eesmärgid

1. Lihtsustab õpitehnoloogiatega tutvumist. Õppijad osalevad praktilisel koolitusel, saavad vajalikul määral juhendamist õpihaldussüsteemi Classfronter võimaluste kohta: asünkroonne arvutipõhine konverentsisüsteemi (“ajurünnak”, diskussioonid, sünkroonne jututuba) ja failide laadimine. Esimesed kaks kursust alustatakse juba auditoorse kohtumise ajal ja esimesed virtuaalsed õppetegevused viiakse läbi samuti kohapeal ja tuutorite juhendamisel. Õppijad loovad enda tutvustused veebis ja osalevad virtuaalse klassitoa loomisel. Tuutorid on kohapeal vajadusel juhendamiseks ja abistamiseks.
2. Kõik osalejad (õppijad ja õppejõud) saavad omavahel tuttavaks ja see tagab parima õpitulemuse ja informaalse suhte õppeperioodiks.
3. Osalejad tutvuvad kursuse pedagoogilise lähenemisega (õppijakeskne kollaboratiivne õpe praktikakogukonnas).
4. Osalejad omandavad sissejuhatavad teadmised kahe esimese kursuse kohta ja sissejuhatuse ka kahe järgmise kursuse alustamiseks.
5. Osalejad omandavad teadmised tugisüsteemide tööst ja arusaamise globaalses keskkonnavõrgustikus osalemisest.

Sotsialiseerimine ja tugi

Positiivse suhtlemise ja koostöö eelduseks on omavaheliste informaalsete suhete olemasolu. Auditoorne õppetsükkel võimaldab isiklike suhete loomise. Professor Mary Thorpe kirjeldab õppijate tugisüsteemi kui süsteemi, mis loob tuttavale õppijale või rühmale vastamise tunnetuse. Põhiidee on tuttavate inimestega kohtumine virtuaalses keskkonnas (Thorpe, lk.48). Thorpe leiab ka, et täiskasvanud õppijad suudavad edukalt osaleda kuudepikkuses virtuaalses ja geograafiliselt isoleeritud õppetöös edukalt vaid juhul, kui kaugõppe perioodile eelneb auditoorne kohtumine kaasosalejatega (Thorpe, lk. 64).

Paljud distantsilt õppijad kaebavad isoleerituse tunde tekkimise üle ja samuti informaalsete diskussioonide puudumise üle. See on ilmselt ka üks suure väljalangevuse põhjuseid kaugõppekursuste puhul. Kogemus näitab, et juhendamine vähendab väljalangemist (Thorpe,lk.50). Ka selle kursuse õppejõudude kogemus tuutorina ja veebipõhises õppes osalejana kinnitab, et hea õpikeskkonna loomiseks on oluliseks eelduseks just tuutorite toe olemasolu kursusel. Paljud õppijad ja e-õppe praktikud usuvad, et efektiivse õppetöö eelduseks on kursuse jooksul toimiv tugisüsteem ja interaktsioon õppijate vahel. Virtuaalsete konverentside toel kujunevad enam pigem toetusel põhinevad ja mitte pakettidel põhinevad kaugõppe vormid (Thorpe, lk. 48). Pakettidel põhinev õppetöö (õppija saab raamatud ja multimeedia CD ja osaleb iseseisvalt veebipõhises õppetöös) seondub kaugõppe teise põlvkonnaga, mille

puhul üldjuhul ei teki suhet õppija ja ülikooli vahel. Vastupidiselt kirjeldatule toetub nn 3. põlvkonna kaugõpe ehk toetusel põhinev süsteem erinevatele õppetegevust toetavatele struktuuridele. Sellist tuge pakuvad tuutorid, kursuse haldajad, ühine suhtlemine veebikeskkonnas. Õppijatele tagatakse juhendamine, mentorlus, tuutorite abi ja tulemusena arenevad ka õppija organisatsioonilised ja inimlikud oskused (Simpson, 2002, lk.9-15).

Auditoorne sessioon programmi alguses võimaldab tuutoritel õppijatega tuttavaks saada – eriti oluline on see just heterogeensete rühmade puhul. Auditoorsete kohtumiste tulemusel on tuutoritel võimalik anda individualiseeritud abi. Õppija omapäraga arvestamine aitab mõista võimalikke reaktsioone, vastuste mustreid ja õppija reaalseid vajadusi (Thorpe, lk. 54). Reaalne tagasiside õppijatelt kinnitab, et ilma tuutori toeta oleks tehnoloogiliste probleemide ja õppematerjalidega hakkamasaamine olnud palju keerulisem (Thorpe, lk.56), "tuutori olemasolu on paljude õppijate jaoks oluliseks aktiveerimismeetodiks ja pideva õpisuhte tagajaks". Edukas veebipõhine kollaboratiivne kogukond on organisatsioon, kus kogukonna liikmed suhestuvad intellektuaalselt, vaimselt, sotsiaalkultuuriliselt ja interaktiivselt paljude erinevate struktureeritud ja struktureerimata tegevuste abil (Tu&Corry,lk.53). Mida paremini osalejad üksteist tunnevad, seda kergem on ka hea õpikeskkonna loomine.

Millist tuge õppija vajab?

See sõltub paljuski ka sellest, kui kaugele on õppija oma õpingutes jõudnud. Kursuse alguses on oluline abi tehnoloogiliste vahendite kasutamisel, uue õppekava ja terminoloogiaga tutvumisel. Sellist abi on lihtsam anda auditoorse töö käigus, praktilise järeleproovimise käigus ning pideva juhendamise olemasolul.

Programmi auditoorse osa raames soovitame järgmisi tegevusi:

1. Sotsialiseerimine õppijate vahel ja õppija-juhendaja/tuutori vahel. Ülesandeks on luua isiklikud suhted, mis tagavad empaatilise suhtlemise hilisemas virtuaalses klassiruumis ja eduka koostöö veebipõhiste konverentside käigus (Zimmer,2004,lk. 141-144). Õppijatel peaks tekkima tunne, et koos suudetakse kursused edukalt läbida ja et nad saavad üksteisele loota.
2. Tehnoloogilised takistused tuleb auditoorse alustsükli käigus ületada. Kõik osalejad peavad suutma virtuaalsesse õpikeskkonda siseneda ja eri vahendeid kasutada. Oluline on ka oma tuutoritega tutvumine.
3. Pedagoogilised küsimused tuleb läbi arutada ja praktiliselt läbi katsetada. Paljudel tudengitel puudub konstruktivistliku õppimise kogemus. Sügava ja pinnapealse õppimise mõisteid, strateegilise õppimise olemust tuleb selgitada alustsükli käigus, tagamaks alustavate tudengite koostöö hilisemas veebikeskkonnas.
4. Õppijad peavad saama sissejuhatava teabe enamiku kavandatavate kursuste kohta.
5. Õppijad peavad saama piisava teabe hindamismeetodite kohta.
6. Õppijad peavad saama sissejuhatava teabe õpijuhiste ja planeeritavate tegevuste kohta.
7. Õppijaile tutvustatakse õpikalendrit ja tähtaegasid. Õppijad peavad omandama arusaama ajalistest piirangutest ja tähtaegade olulisusest ning tajuma ajaliste piirangute ja koostöös õppimise omavahelist seotust.
8. Õppijad peavad saama ülevaate ülikooli raamatukogu võimalustest. Füüsiline raamatukogu külastamine ja võimaluste tutvustamine kohapeal aitab õppijal edaspidi raamatukogu ressursse veebipõhiselt efektiivsemalt ära kasutada.
9. Tagatakse tuutorite, õppejõudude ja tehnoloogiliste vahendite tutvustamine.
10. Auditoorne alustsükkel on tugev motiveeriv tegur võimalike isiklike kahtluste ja takistavate tegurite kõrvaldamisel.

Kultuuriliste erinevuste sobitamine

Rahvusvaheliste kursuste puhul tuleks erinevusi tervitada ja rühmakoostöö üles ehitada sarnasuste rõhutamisele. Inimesed, kes on omandanud kõrghariduse, omavad head arvuti- ja keeleoskust ja kellel on võimalik kulutada kaks aastat edasiõppimisele, on osa väikesest elitaarsest inimkonna osast. Erinevused on samas reaalsus ja kõik osalejad peaksid sellest positiivselt teadlikud olema.

(NB! Täpsemalt on teoreetilist käsitlust võimalik lugeda inglisekeelses versioonis).

Ülesehitus
Lühiajalise intensiivse auditoorse tsükli korraldamise puhul on alati oht informatsiooni ülekküllusega reaalse tulemuse positiivsust vähendada. Siinkohal on oluline läbimõeldud kursuse ülesehituse loomine. Sessioon peaks algama sotsialiseerumise ja isiklike suhete loomisega, samal ajal vältides õpperühma siseste „klikkide" tekkimist. Õpihaldussüsteemi ja tehnoloogiliste vahenditega tutvumine on oluline ja see peaks toimuma võimalikult sessiooni alguses. Samuti peavad sellele järgneva virtuaalse klassiruumi proovitööd arvutiklassis ja oskuslik üleminek tegelikule 100% veebipõhisele koostööle. Pedagoogilise lähenemise tutvustamine ja diskusioon peab samuti igal juhul eelnema esimesele sisulisele õpimoodulile.

Kursuse toimumise keskkond
Oluline on tuutorite osalemine õppijatega võrdses positsioonis; osalejad peaksid asuma looduslähedases, ülikoolile lähedal asuvas, heade elamistingimustega ruumides. Hea internetiühendus ja väikeste konverentsiruumide olemasolu on hädavajalik, sest õppijad peavad kursuse sisuga töötama ka õhtuti, nii iseseisvalt kui väikestes rühmades. Kirjeldatud auditoorne sessioon moodustab programmi kõige kulukama osa.

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Palun kirjeldage...
1. Kuidas on kursuse sisu esitatud (kui võimalik, siis esitada ka osakaalud)
☒ Auditoorsed loengud 12%
☒ PowerPoint esitlused 2%
☒ Elektroonilised materjalid veebis, õpihalduskeskkond, täistekstid ja/või slaidid 58%
☒ Videostriiming, videoloengute salvestused, videokonverentsid 1%
☒ Audiostriiming, audioloengute salvestused 12%
☒ Animatsioonid 2%
☒ Graafikud, illustratiivsed tabelid ja pildid 10%
☒ Integreeritud lahendused (nt slaidid kombineeritud audio/video materjalidega) 2%
☐ CD, DVD 1%
☐ Muu: .....
☒ Suhtlemine
☒ Rühmatööd
☒ Õpijuhis
☒ Kursuse sisu
☒ Tagasiside andmine, tehniline tugi, kursuse organisatoorne abi
☒ Kursuse korraldusega seotud info (kontakt, läbimise nõuded, oodatavad õpitulemused, jm)
☒ Tööde hindamine
☒ Hindamine
☒ Testid
☒ Enesetestid
☒ Enesehindamine
☒ Lisamaterjalid

ÕPIPROTSESSI KIRJELDUS

Probleemipõhine õpe, kollaboratiivne õpe, mõned iseseisvalt läbitavad kursused.

Moodul 1: Taustainfo. Keskkonnaprobleemid ja muudatused rõhuasetustes
Muutused rõhuasetustes teeäärselt prügilt pestitsiidide kasutamise, globaalse soojenemise, osoonikihi muudatuste, biodiversiteedi ja GMOde suunas; keskkonnapoliitika muutumine ajaloo, poliitikate ja tegevuste taustal.

Toimumise aeg: 24 Oktoober – 5 November
Mooduli eesmärgid
Selle ploki läbimisel on õppijad omandanud arusaama, kuidas keskkonnateadlikkus on ajas muutunud ja aktuaalsust suurendanud.

Mooduli eesmärgid

Teadmine:
Õppijad peavad suutma kirjeldada ja rakendada tehnoloogiliste õpivahendite abil järgmisi teemasid (omal valikul):

- Keskkonnateaduse olulisemad sündmused hiljutises ajaloos ja maailma ajaloo kontekstis
- Peamiste maailma keskkonnapoliitikate ja tegevuste kujunemine
- ”Mainstream” keskkonnadiskursus ja erinevad lahknevad käsitlused.

Oskused:
Õppijad peavad oskama efektiivselt osaleda e-õppe keskkonnas ja osalema arvutipõhises probleemipõhises koosõppes.

1.1.1 Ülesanne 1

Tutvuda ja mõista muutusi viimase 50-60 aasta jooksul toimunud keskkonnalase teadlikkuse ja keskkonnatunnetuse muutusi.

Tegevus 1 (6 tundi)
Loe arutelu osa GEO-3 raamatu peatükis 1. Koosta interaktiivne keskkonnapoliitiliste sündmuste ajaline järgnevus alates 1960. aastatest. Alusmaterjalina saab kasutada faili CD-ROMil või allpooltoodud veebilehel. Püüa märgata ka „varajasi vihjeid” sündmustele, nt. “Limits to growth”, Seveso katastroof, jms.
http://www.gvu.unu.edu/Timeline/index.htm

Tegevus 2 (12 tundi)
a. Vii läbi informaalne intervjuu vähemalt ühe alla 60-aastase isikuga. Palu vastajal võrrelda tema teadlikkust keskkonnaküsimuste osas 1960. aastatel ja praegu. Võrdle erinevusi probleemide tunnetamises. Kas vastaja suudab nimetada mõnd olulist keskkonnaalast juhtumist 30-50 aastat tagasi? Miks ta peab seda juhtumit oluliseks?
b. Kirjuta uurimistöö (maksimum 500 sõna) intervjuu tulemuste esitamiseks. Võrdle tulemusi eelnevalt koostatud ajalise järgnevuse failiga. Lae dokument enda e-portfooliosse.
c. Võrdle ja arutle enda töö tulemusi teiste rühmaliikmete omadega. Koostage saadud tulemuste põhjal ühine uurimus (maksimum 1000 sõna). Laadige dokument oma rühmakataloogi.

Tegevus 3 (4 tundi)
Rühma diskussioon Osale tüüpilises 1980. aastate diskussioonis:
Teema: „Vaesus on saastatuse halvim vorm”
Indira Ghandi, India peaminister (1966-77 ja 1980-84)
Seda harjutust on kasutatud praktilise veebipõhise koostööülesandena kogumaks argumente edaspidiste esseede koostamiseks. Otsige informatsiooni kursuse õpikust, koostatud ajagraafikutest, raamatukogust ja internetist. Viita kasutatud allikmaterjalidele. Esita tulemused lühikese, postkaardi stiilis tekstina. Lead’ina võid kasutada mõnd definitsiooni, argumenti oma isiklikku seisukohta või mõnd avalikku väljaütlemist.

1.1.2 Ülesanne 2

Tutvu olulisemate keskkonnaprobleemidega ja nende seostega arenguküsimustesse.

Tegevus 1 (10 tundi)
Loe läbi UN Millennium Declaration, (ÜRO Peaassamblee, September 2000)
http://www.un.org/millennium/declaration/ares552e.pdf ja selle dokumendi analüüsi „Synthesis report of the Millennium Ecosystems Assessment". Otsi materjale veebist: http://www.maweb. org/en/Newsroom.aspx

Tegevus 2 (20 tundi)

a. Otsi vajalikku informatsiooni ja arutle oma rühmas teemal "Kaasaja kolm põletavamat keskkonnaprobleemi". Valige rühmas moderaator ja vastutav liige. Kirjutage rühmaessee (maksimum 3000 sõna), laadige see rühmakataloogi.
b. Koostage essee argumentide põhjal 20-minutiline loeng. Koostage PowerPoint slaidid esitlemiseks Lions klubi liikmetele, Rotary klubile, vms. Alternatiivne võimalus: looge veebipõhine presentatsioon. Laadige fail rühmakataloogi.

Tagasiside ja hinnangud: (1 tund)
Saadud tagasiside on oluline ennekõike õppijatele ja tuutoritele. Hindamine oli formatiivne, tagades tagasiside õppijatele ja õppejõududele, osaliselt ka neile, kes kursusest maha jäänud. Oluline on, et õppijad hindaksid ka oma õpiprotsessi ja võimalusi selle parendamiseks. Tagasiside harjutuse koostamisele peaks kuluma aega 1 tund või vähem. Vastused on konfidentsiaalsed ja ei tohi saada kättesaadavaks väljaspool rühma ilma informatsiooni anonümiseerimiseta. Tuutoritel on õigus edastada isikuandmeteta vastuste kokkuvõte kursuse arendajatele edaspidiste kursuse parenduste sisseviimiseks.

Tagasiside:

1. Vaata üle mooduli õpieesmärgid. Kas sa õppisid seda, mida eeldati?
2. Kas see oli kergem või raskem, kui sa olid eeldanud?
3. Mis oli raske, mis lihtne? Miks?
4. Mis oli kõige kasulikum? Miks?
5. Mis oli kõige ebavajalikum? Miks?
6. Kas sinu kindlus teemaga seonduvalt on kasvanud?
7. Kas sinu õpioskused on arenenud? Kuidas?
8. Kas on midagi, mida sa saaksid enda õpiviisides parandada?

Hindamine:

9. Kas planeeritud ajakulu iga tegevuse jaoks oli optimaalne?
10. Kas õppijatevahelist suhtlemist oles võimalik kuidagi parandada?
11. Kas tuutorite osalemine oli optimaalne või peaks seda suurendama/vähendama?
12. Kas tuutorite tagasiside oli hea ja piisav?
13. Kas tuutorid on piisavalt „lähedased" või suhtlevad liigse distantsitundega?
14. Kas sul on ettepanekuid mooduli parendamiseks?

Õppijate hindamine (lõpphinne moodustub järgmistest elementidest (osakaal)):
☒ Aktiivne osalemine kursusel (nii auditoorne kui veebipõhine õpe) 10%
☐ Osalemine foorumidiskussioonides……%
☐ Osalemine seminaridel……%
☒ Iseseisvate tööde läbimine 40%
☐ Rühmatööde läbimine ……%

☐ Testide tulemused……%
☐ Osalemine kontaktpäevadel……%
☒ Eksam/arvestus 50%

EVALVATSIOONI TULEMUSED

Tulemused:
Head

Evalvatsiooni tulemused:
keskmine

Üldhinnang kursusele:
Hästi omandatud

KONTAKTINFORMATSIOON

Veebiviited:
http://gvu.unu.edu

Artiklid jm viited:
http://gvu.unu.edu/linklib.cfm?pageid=1045&categoryid=102

Kontaktandmed:
Åke Bjørke, bjoerke@grida.no ,+4792047626
http://www.grida.no/Contact.aspx?staffID=6

KURSUSE KIRJELDUS

Kursuse nimi:
Õpiteooriad

Ülikool, osakond, riik:
Stord/Haugesund Ülikooli Kolledž, Haridusteaduskond, Norray

Ainepunkte:
10 AP

Keel:
Norra keel

Õppevaldkond:
IKT

Õppeaste:
Magistriõpe

Kursuse tüüp:
Loengud

Kursuse Kirjeldus:
Selles moodulis tutvuvad osalejad õpiteooriatega ja digitaalsete vahendite kasutamise meetoditega õppetöös. Kursuse keskne sisu on IKT vahendite kasutamine ja õppetegevusse integreerimine.

Sisu:
Peamised õppimisega seonduvad juhised
Mälu
Metatunnetus
Teadmiste edastamine
Sotsiaalne õppimine
Teooriate seostamine praktiliste situatsioonide ja kogemusega

Kursuse materjalid:
Alessi, S. M. & Trollip, S. R. (2001). Multimedia for learning - Methods and development. Needham Heights, Massachusetts: Allyn & Bacon

Atherton, J. S. (2003). Learning and Teaching: Learning index. [Online]. http://www.learningandteaching.info/

Salomon, G. & Dekel, A. (2004). An e-learning course on LEARNING. Nettressurs HSH

Kursuse veebileht
Vajalik eelnev õpihaldussüsteemi (Fronter) pealehelt sisenemine

Tudengeid:
30

Õppejõude:
3

Tuutoreid:
3

PEDAGOOGIKA

Õpieesmärgid:
Õppijad omandavad teadmised õpiteooriatest ja IKT vahendite rakendamise meetoditest. Kursuse keskseks teemaks on IKT vahendite kasutamine ja integreerimine õppetöösse.

Pedagoogiline lähenemine:
Rakendatakse järgmisi teooriaid ja mudeleid:
- Kollaboratiivne ja konstruktivistlik õpetamine
- Probleemipõhine õpe
- Projektipõhine õpe

Innovaatilised elemendid:
Päevase ja kaugõppe tudengite õppetöö ühendamine sama kombineeritud kursuse raames on oluline innovaatiline element.

TEHNOLOOGIAD

Kasutatavad tehnoloogiad:
Õpihaldussüsteem
E-mail
Jututuba
Videokonverentsid
Video edastamine

Tehnoloogiliste vahendite kasutamise kirjeldus:
Tehnoloogia kasutamine on kohandatud samaaegselt rahuldama päevases ja kaugõppe vormis õppivate tudengite vajadusi. Õppijad kasutavad palju nii õpihaldussüsteemi kui ka internetivahendeid üldiselt.

Veebipõhiselt on läbi viidud järgmised tegevused:

- Materjalide levitamine
- Videomaterjalide levitamine (nii sünkroonne kui ka asünkroonne)
- Suhtlemine (õpetaja ja õppija vahel ja õppijad omavahel)
- Asünkroonne kommunikatsioon
- Juhendid
- Koostöö ja ühisõpe

Õigustus tehnoloogia kasutamiseks:
Ennekõike on tehnoloogiliste vahendite kasutamine vajalik integreeritud õpikeskkonna loomiseks päevase ja kaugõppe tudengite jaoks ühiselt.

Innovaatilised elemendid:
Sünkroonse ja salvestatud videomaterjali kasutamine muudab kursuse õppija vajadustele paremini vastavaks. Innovaatiliseks saab pidada ka tehnoloogilisi koostöövahendeid.

KOMBINEERITUD ÕPIMEETOD

Detailne kirjeldus:
Auditoorne õppetöö moodustab suhteliselt väikese osa programmist. Samuti on osa auditoorselt esitatud infost edastatud videokonverentsi vahendite abil.
Juhendamine toimub vastavalt tudengite asukohale.
Päevase õppe tudengitel on võimalik saada juhendamist auditoorses vormis, kaugõppes õppijate puhul kasutatakse juhendamiseks e-maili, õpihaldussüsteemi, sünkroonse kommunikatsiooni vahendeid (MNS) ja asünkroonseid kommunikatsioonivahendeid (diskusioonifoorumid). Kogemus näitab, et ka päevase õppe tudengid soovivad õppimiseks ja suhtlemiseks kasutada suures osas samasid vahendeid. Suhtlemine õppijate vahel rühmades, kuhu kuulub nii kohapeal kui kaugõppe õppivaid tudengeid, on samuti korraldatud sünkroonsete ja asünkroonsete diskussioonivahendite abil.

Palun kirjeldage...
1. Kuidas on kursuse sisu esitatud (kui võimalik, siis esitada ka osakaalud) .
☒ Auditoorsed loengud.....%
☒ PowerPoint esitlused.....%
☒ Elektroonilised materjalid veebis, õpihalduskeskkond, täistekstid ja/või slaidid.....%
☒ Videostriiming, videoloengute salvestused, videokonverentsid.....%
☐ Audiostriiming, audioloengute salvestused.....%
☐ Animatsioonid.....%
☒ Graafikud, illustratiivsed tabelid ja pildid .....%
☐ Integreeritud lahendused (nt slaidid kombineeritud audio/video materjalidega) .....%
☐ CD, DVD.....%
☐ Muu: .....

2. Millised kursuse osad on läbi viidud veebipõhiselt:
☒ Suhtlemine
☒ Rühmatööd
☒ Õpijuhis
☒ Kursuse sisu
☒ Tagasiside andmine, tehniline tugi, kursuse organisatoorne abi
☒ Kursuse korraldusega seotud info (kontakt, läbimise nõuded, oodatavad õpitulemused, jm)
☒ Tööde hindamine
☒ Hindamine
☐ Testid
☐ Enesetestid
☐ Enesehindamine
☐ Lisamaterjalid

ÕPIPROTSESSI KIRJELDUS

Õpiteooriate ülevaade.
IKT vahendite integreerimine eri õppemeetodite kasutamisel.
Magistritöö teema valimine ja essee koostamine teemapüstituse avamiseks
Õpiobjektide loomine IKT vahendeid kasutades ja seostatult eri õpiteooriatega.

Õppijate hindamine (lõpphinne moodustub järgmistest elementidest (osakaal)):
☐ Aktiivne osalemine kursusel (nii auditoorne kui veebipõhine õpe) .....%
☐ Osalemine foorumidiskussioonides.....%
☐ Osalemine seminaridel.....%
☒ Iseseisvate tööde läbimine.....%
☐ Rühmatööde läbimine .....%
☐ Testide tulemused.....%
☐ Osalemine kontaktpäevadel.....%
☐ Eksam/arvestus.....%

EVALVATSIOONI TULEMUSED

Kursuse on läbinud 40 magistanti, väljalangemise osakaal on väga madal.
Õppijate tagasiside on positiivne.

KONTAKTINFORMATSIOON

Lisainfo:
http://stud.hsh.no/lu/inf/master/ (norra keeles)

http://www.hsh.no/english/ICT_in_Learning.pdf (inglise keeles)

Kontaktandmed:
Jostein Tvedte
jostein.tvedte@hsh.no
+47 53 49 13 78

KURSUSE KIRJELDUS

Kursuse nimi:
Matemaatiline programmeerimine

Ülikool, osakond, riik:
Vytautas Magnus Ülikool, Rakendusinformaatika osakond, Kaunas, Leedu

Ainepunkte:
6

Keel:
Leedu keel, inglise keel

Õppevaldkond:
matemaatika

Õppeaste:
Bakalaureuseõpe (4. kursus)

Kursuse tüüp:
Loengud +laboratoorsed tööd +iseseisev töö + veebipõhine koostöö ja suhtlemine +lõputöö projekt

Kursuse Kirjeldus:
Kursuses kombineeritakse teoreetilisi käsitlusi ja praktilisi lähenemisi. Kursuse põhieesmärk on õppijate praktiliste oskuste arendamine selliselt, et õppija suudaks formuleerida praktilisi matemaatilisel terminoloogial baseeruvaid optimeerimisülesandeid, oskaks rakendada teoreetilisi mudeleid ja leida sobivaid algoritme praktiliste matemaatiliste ülesannete lahendamiseks ja mõistma optimeerimise tulemusi. Samuti peaksid õppijad kursuse jooksul suutma juhendada ja kommenteerida teiste õppijate pakutud lahendusi.

Kursusel käsitletakse probleemide klassifikatsioone ja lahendusmudeleid (Gradient meetod, pööratud gradient meetod. Newtoni meetod ja selle modifikatsioonid. Otsingumeetodid). Veel käsitletavaid teemasid: piirangutega ülesannete miinimumtingimused; piirangute ja penalti meetodid tingimuslike ülesannete lahendamisel. Lineaarne programmeerimine. Aluslahendid. Simplex algoritm. Polünoomilise funktsiooni meetod lineaarses programmeerimises. Mitmetingimuslik optimeerimine.

Kursuse loomisel võeti arvesse sarnaste kursuste kogemusi maailmas ning akumulatiivse kogemuse mudeli rakendamismudelit optimeerimise õpetamisel .

Kursuse materjalid:
1) Antanas Žilinskas, Matematinis programavimas (pdf and html formaadis, leedu keeles)
2) Benny Yakir, Nonlinear optimization (pdf dokument)

3) Jonas Mockus, Global and discrete optimization (html dokument)
4) Artikkel: “Jens Clausen Teaching Duality in Linear Programming - the Multiplier Approach’ (pdf dokument)

Lisamaterjalid:
1. Žilinskas A. Matematinis programavimas. VDU, 1999, in Lithuanian.
2. Bazaraa M., Sherali H., Sheti C., Nonlinear programming. J.Wiley, 1993
3. Bertsekas D. Nolinear Programming. Athea Scienfic,1995

Kursuse veebileht:
(http://fcim.vdu.lt/Conferences/F00017C98/F00052D02/?WasRead=1) (leedu keeles)
Kursusel kasutatav sõnaraamat ja juhend: http://mathworld.wolfram.com/

Tudengeid:
Umbes 100

Õppejõude:
1 ja 1 assistent

Tuutoreid:
1

PEDAGOOGIKA

Õpieesmärgid:
Õppijad peaksid kursuse läbimise järel mõistma ja oskama rakendada optimeerimise teooriat ja põhialgoritme, optimeerimis-paketiga tarkvara kasutamist. Teoreetiliste loengute ja praktiliste tööde käigus õpivad tudengid formuleerima praktilisi optimeerimisülesandeid matemaatilist terminoloogiat kasutades, rakendama teoreetilisi mudeleid ja leida sobivaid algoritme praktiliste matemaatiliste ülesannete lahendamiseks ja mõistma optimeerimise tulemusi. Samuti peaksid õppijad kursuse jooksul suutma juhendada ja kommenteerida teiste õppijate pakutud lahendusi.

Pedagoogiline lähenemine:
Kursuse põhimõtted baseeruvad projektipõhise õppe meetodil. Kursuse väljatöötamisel analüüsiti teiste ülikoolide kogemusi sarnaste kursuste väljatöötamisel. Kursusele eelnevad kohustuslikud ained töötlussüsteemidest ja simulatsioonidest tagavad õppijate vajalikud eeldusoskused ja süsteemide loomise kogemuse. Traditsioonilisi õpetamismeetodeid kombineeritakse projektipõhise õppe meetodite ja diskussioonipõhise õppega. Teoreetiline osa läbitakse iseseisvalt ja toetavate loengute raames, olemas on ka veebipõhised loengusalvestused. Diskussioonide käigus arutletakse õppejõu püstitatud teemadel. Kõik ülesanded on kohustuslikud ja tuleb esitada vastavalt veebipõhises kalendris kehtestatud tähtaegadele. Veebis on olemas ka informatsioon õppejõudude vastuvõtuaegade kohta.

Innovaatilised elemendid:
Probleemõppe mudelid määravad tegevused, mille sooritamine viib positiivse tulemuseni. Õppijad kontrollivad stsenaariumitest ja situatsioonidest arusaamist veebipõhiste meeskonnatöö ülesannete käigus. Nii õppijad individuaalselt kui ka rühmad ühiselt täidavad veebipõhiseid tabeleid, kus kirjeldavad, mida nad teavad ühe või teise teema kohta. Samuti on tabelis olemas veerg „Mida peaksime teadma?" Pärast rühmaküsimuste koostamist on võimalik suhelda õppejõuga foorumis või loengute raames. Õppijad jagavad omavahel vastutuse info kogumise, haldamise, analüüsimise ja interpreteerimise eest.

Töö protseduur on ülesehitatud küsimuste järgnevusele: vahetage arvamusi, kaaluge alternatiive, arutage võimalike tegevuskavade plusside ja miinuste üle, (iga õppija ja/või rühm võib püstitada ja testide uusi hüpoteese), esita uurimistulemustele tuginev lahendus. Selle tsükli läbimise järel peavad õppijad koostama presentatsiooni, mis mh sisaldab probleemi lahendamise võimalusi ja valitud seisukohtade õigustamist. Presentatsiooni koostamisel on väga soovitav erinevate interatiivsete vahendite kasutamine (nt pildid, graafikud, heli).

Pedagoogikaalased viited
Probleemõppe metoodika: PBL, http://www.udel.edu/pbl/
The Power of Problem-Based Learning, A Practical "How To" For Teaching Undergraduate Courses in Any Discipline, edited by Barbara Duch, Susan Gron, and Deborah Allen, Stylus Publishing, LLC (2001), 256 lehekülge

TEHNOLOOGIA

Kasutatavad tehnoloogiad:
1) kursuse veebileht
2) elektrooniline sõnaraamat koos linkidega lisainformatsioonile
3) Elektrooniline foorum
4) E-mail suhtlemiseks professoriga
5) Loengute edastamine videokonverentsidena
6) Virtuaalne õpikeskkond (FirstClass)

Tehnoloogiliste vahendite kasutamise kirjeldus :
Praktiliste tööde juhendid on esitatud veebipõhiselt, olemas on illustreerivad materjalid ja näited (õppijate koostatud), viited veebimaterjalidele ja olemasolevale tarkvarale.

Tehnoloogiliste vahendite kasutamise õigustus:
Elektrooniliste õppematerjalide loomine võimaldab õppejõul juba eeltööna sisu esitamise läbi mõelda ja korraldada. Materjalide loomisele kulutatud aeg on kumulatiivne, kuivõrd olemasolevaid tekste, graafikuid jm materjale on alati võimalik ümber korraldada ja täiendada. Virtuaalses õpikeskkonnas on suurimaks eeliseks just õppeprotsessi administreerimise lihtsus. Elektrooniline süsteem suudab sageli jälgida õppija edenemist jms. Elektroonilised süsteemid toimivad kõige tõhusamalt just auditoorse õppe toena ja mitte isoleeritud keskkonnana.

KOMBINEERITUD ÕPIMEETOD

Detailne kirjeldus:
Kombineeritud vormis auditoorsed loengud (kokku 15 kahetunnist loengut) ja seminarid ja veebipõhine koostöö (diskussioonifoorumid, veebipõhised küsimustikud, videokonverentsid (kuus 1,5-tunnist loengut), elektroonilised õppematerjalid ja õppijate tööde korrastamine veebis ning õppijate individuaalne töö kokku 52 tunni ulatuses ning lõpuks 15 laboratoorset praktikumi arvutiklassis (2 tundi). Lisaks on olemas elektroonilise suhtlemise ja tööde esitamise võimalus.

Palun kirjeldage...
1. Kuidas on kursuse sisu esitatud (kui võimalik, siis esitada ka osakaalud)
☒ Auditoorsed loengud 28% kogu kursusest
☒ PowerPoint esitlused 90% presentatsioonidest
☒ Elektroonilised materjalid veebis, õpihalduskeskkond, täistekstid ja/või slaidid .....%
☒ Videostriiming, videoloengute salvestused, videokonverentsid.....%
☐ Audiostriiming, audioloengute salvestused.....%
☐ Animatsioonid.....%
☒ Graafikud, illustratiivsed tabelid ja pildid .....%
☒ Integreeritud lahendused (nt slaidid kombineeritud audio/video materjalidega) .....%
☐ CD, DVD.....%
☐ Muu: .....

2. Millised kursuse osad on läbi viidud veebipõhiselt:
☒ Suhtlemine
☒ Rühmatööd
☐ Õpijuhis
☒ Kursuse sisu
☒ Tagasiside andmine, tehniline tugi, kursuse organisatoorne abi
☒ Kursuse korraldusega seotud info (kontakt, läbimise nõuded, oodatavad õpitulemused, jm)
☒ Tööde hindamine
☒ Hindamine
☒ Testid
☒ Enesetestid
☐ Enesehindamine
☒ Lisamaterjalid

ÕPIPROTSESSI KIRJELDUS

1. Loengud
2. Lugemine ja teoreetilise materjali analüüs
3. Veebipõhised metakognitiivsed diskussioonid
4. Videoloengud

5. Vaatlused (enesetestid)
6. Praktikum (3 eri ülesannet)
7. 5 laboratoorset tööd

A. Diskussioonide eesmärk: Tudengid õpivad aru saama ja analüüsima kursuse materjale ja informatsiooni

Õpimeetodite kirjeldus
Pärast loengut toimub õppijatevaheline diskusioon valitud teemal eesmärgiga leida sobiv lahendus püstitatud probleemile. Õppejõu ülesandeks on aidata õppijal materjalide sisust aru saada ja selgitada küsimusi tekitanud kohti. Pärast ülesande lahenduse esitamist on õppejõu ülesandeks produkti analüüs ja tagasiside andmine.
Soovitavad tulemused
Eesmärgiks on hinnata õppijate teemast arusaamist.
Ülesande sooritamise juhend
Osalemine on kohustuslik, diskussioon toimub veebipõhiselt.
Tulemuse vorm ja pikkus
Diskussioon on avatud 1 nädala jooksul. Tulemused esitatakse elektrooniliselt.
Tulemuse esitamine
Esitatakse ülesande lahendus ja diskussiooni logifailid.
Hindamiskriteeriumid
Hindamise aluseks on lahenduskäigu korrektsus. Õppejõud saab hinnata logifailide põhjal õppijate aktiivsust diskussioonis.
Kokkuvõte
Õppijad peaksid diskussiooni järel hästi mõistma optimeerimismetoodikat ja olema võimelised läbima vastava testi ja koostama praktilisi teemaga seonduvaid ülesandeid.

B. Ülesannete (3) eesmärk: Lineaarse programmeerimise ülesannete lahenduse esitamine geomeetriliselt.

Õpimeetodite kirjeldus
Koosta lineaarse programmeerimise ülesanne.
Soovitavad tulemused
Tulemus esitatakse kumera hulktahukana.
Ülesande sooritamise juhend
Ülesande sooritamine toimub vastavalt eelnevalt esitatud teoreetilisele materjalile.
Tulemuse vorm ja pikkus
Wordi dokument. Ülesande lahendamise aeg on kaks nädalat.
Tulemuse esitamine
Kumer hulktahukas lineaarse programmeerimise tulemusena.
Hindamiskriteeriumid
Esitatud tulemuse õigsus.

Õppijate hindamine (lõpphinne moodustub järgmistest elementidest (osakaal)):
☐ Aktiivne osalemine kursusel (nii auditoorne kui veebipõhine õpe) .....%
☐ Osalemine foorumidiskussioonides.....%
☐ Osalemine seminaridel.....%
☒ Iseseisvate tööde läbimine 33%
☐ Rühmatööde läbimine .....%
☒ Testide tulemused 17%
☐ Osalemine kontaktpäevadel.....%
☒ Eksam/arvestus 50%

KONTAKTINFORMATSIOON

Lisainformatsioon:
Kursuse veebileht
http://fcim.vdu.lt/Conferences/F00017C98/F00052D02/?WasRead=1
Kursusel kasutatav sõnaraamat ja juhend: http://mathworld.wolfram.com/

Artiklid ja viited:
1. Žilinskas A. Matematinis programavimas. VDU, 1999, in Lithuanian
2. Bazaraa M., Sherali H., Sheti C., Nonlinear programming. J.Wiley, 1993
3. Bertsekas D. Nolinear Programming. Athea Scienfic,1995

Kontaktandmed:
Antanas Žilinskas, e-mail: antanasz@ktl.mii.lt , tel.: +370 37 327900

KURSUSE KIRJELDUS

Kursuse nimi:
Vajaduste analüüs

Ülikool, osakond, riik:
Kaunase Tehnikaülikool, Tarkvarasüsteemide osakond, Kaunas, Leedu

Ainepunkte:
6

Keel:
Leedu keeles

Õppevaldkond:
Informaatika

Õppeaste:
Magistriõpe, tehnoloogiateaduste valdkond. Õpimoodul „Vajaduste analüüs" on üks neljast tarkvarasüsteemide magistrikava põhimoodulist. Ülejäänud moodulid programmis on 'Tarkvarasüsteemide arhitektuur", „IKT projektijuhtimises" ja „Tarkvara rakenduste analüüs".

Kursuse tüüp:
Loengud+individuaalne õpe+veebipõhine suhtlemine ja koostöö +lõputöö projekti kirjutamine

Kursuse Kirjeldus:
Põhitähelepanu on suunatud vajaduste analüüsile ja spetsifikatsioonide koostamisele. Magistrandid omandavad vajalikud meetodid ja vahendid vajaduste analüüsi sooritamiseks kohe õppeprogrammi alguses ja saavad edaspidi omandatud teadmisi rakendada järgnevates õpimoodulites ja magistritöö koostamisel. Samaaegselt toimuvad ka Tarkvaralahenduste loomise protsessi jaTarkvara süsteemide haldamise kursused. Kursuste eesmärgiks on laiendada ja täpsustada üliõpilaste tarkvarasüsteemide alaseid teadmisi, mis on omandatud bakalaureuseõppe käigus. Õppemooduli käigus tutvuvad õppijad standarditega, koostavad lõputöö projekti, plaani ja vajaduste spetsifikatsiooni.
Peamised käsitletavad teemad: tarkvara spetsifikatsiooni dokument, vajaduste arenemine, probleemi analüüs, süsteemi kirjeldus, andmemodelleerimine, funktsionaalsed ja mittefunktsionaalsed vajadused, prototüüpide kasutamine, vajaduste dokumendi arendamine.

Kursuse materjalid:
Metoodilised materjalid:
http://proin.ktu.lt/~kestas/Proj_vald/Kepure.html (leedu keeles)
Tarkvarastandardid:
http://soften.ktu.lt/~virga/mag_atmintine/1sem/standartai.htm
Muu kirjandus: http://soften.ktu.lt/~virga/mag_atmintine/interneteka.html

Lisamaterjalid:
1. I.Sommerville. Software Engineering. Addison-Wesley, 4,5, 6 editions
2. R.S. Presman and D.Ince. Software Engineering - A Practitioner's Approach. McGraw-Hill, 3, 4,5 editions
3. G.Booch. Object-Oriented Analysis and Design. The Benjamin/ Cummings Publishing Company,Inc., 1994
4. R Pooley and P Stevens. Using UML: Software Engineering with Objects and Components. Addison-Wesley, 1999
5. M.Cotterell, B.Hughes. Software Project Management. International Thompson Computer Press, 1995
6. G.Booch, J.Rumbaugh, I.Jacobson. Unified modeling Keel user guide. Addison-Wesley, 1998
7. I.Jacobson, G.Booch, J. Rumbaugh. The Unified Software Development Process. Addison-Wesley, 2000
8. J.Martin and J. Odell. Object-Oriented Methods:a Foundation. Second UML Edition. Prentice-Hall, 1998
9. C.Larman. Applying UML and Patterns. Prentice-Hall, 2000

Kursuse veebileht:
(http://www.soften.ktu.lt/~virga/mag_atmintine)

Tudengeid:
Umbes 60

Õppejõude:
1

Tuutoreid:
1

PEDAGOOGIKA

Õpieesmärgid:
Õppijad peavad kursuse läbimise järel: tundma ja oskama rakendada vajaduste analüüsi meetodeid ja vahendeid; oskama kombineerida teoreetilisi teadmisi ja praktilisi oskusi tarkvarasüsteemide disainimisel vastavalt kliendi vajadustele. Õppijad omandavad teadmised järgmistest teemadest: Tarkvaratootmise majandus, tarkvara vajadused, tarkvarasüsteemide disainimine.
Oskavad valida sobivad vahendid ja meetodid konkreetse projekti jaoks; oskavad organiseerida individuaalseid ja rühmatöö tegevusi ja on omandanud professionaalsed meeskonnatöö oskused; mõistavad ja on võimelised edasiarendama tarkvaraloomise protsessi; mõistavad tarkvara kvaliteeditingimusi, hinna kujunemist, ajagraafikute koostamise vajadusi; oskavad koostada täieliku dokumentatsiooni tarkvara lahenduste kohta; oskavad esitada tehnilisi kontseptsioone dokumentatsioonis ja suulistes esitlustes.

Pedagoogiline lähenemine:
E-õppe vahenditel on oluline roll õppetöös. Õppetöö haldus on veebipõhine. Õppetöö on üles ehitatud süstemaatilisele ja autonoomsele õppija iseseisvale tööle teoreetiliste teadmiste ja praktiliste oskuste ühendamiseks. Praktiliste ülesannete roll on väga oluline. Pedagoogiliseks lähenemiseks on projektipõhine õpe.

Innovaatilised elemendid:
Moodulis rakendatav tööprotsess, mille puhul kursus keskendub ühe lõpp-produkti korrektsele valmimisele, on otseselt vastav tarkvaraloomise protsessile reaalses elus. Õpetamine liigub järjest enam loengupõhiselt õppetöölt meeskonnatöö projektide, probleemõppe, reaalsete arendustegevuste läbitegemise suunas.

Pedagoogikaalased viited:
Probleemõppe metoodika (PBL) http://www.udel.edu/pbl/
The Power of Problem-Based Learning, A Practical "How To" For Teaching Undergraduate Courses in Any Discipline, edited by Barbara Duch, Susan Gron, and Deborah Allen, Stylus Publishing, LLC (2001), 256 lehekülge
Projektõppe käsiraamat: http://www.bie.org/pbl/pblhandbook/index.php

TEHNOLOOGIA

Kasutatavad tehnoloogiad:
1. Kursuse veebilehekülg (http://soften.ktu.lt/~virga/mag_atmintine/).
2. Õppija portfoolio
3. E-mail
4. Diskussioonifoorum http://proin.ktu.lt

Tehnoloogiliste vahendite kasutamise kirjeldus:
Veebilehele on koondatud projektiteemad, dokumendimallid, näited, standardid, ülesannete esitamise nõuded, ajakavad, tarkvara kvalteedinõuded, samuti tööde esitamise tähtajad ja vajalikud materjalid.
Portfoolio. Kursuse alguses koostab iga õppija individuaalse infosüsteemi, kuhu on kohustuslik laadida kõik nõutud dokumendid ja kodutööd. See infosüsteem on privaatne ja parooliga kaitstud.
E-maili kasutatakse suhtlemiseks õppejõuga.
Foorumis arutletakse kursuse seisukohalt olulistel teemadel.

Tehnoloogiliste vahendite kasutamise õigustus:
Veebileht on vajalik olulise informatsiooni koondamiseks. Samuti on see koht, kjus õppejõud saab teavitada osalejaid tähtaegadest ja nõuetest.
Portfoolio tagab pideva juurdepääsu õppija poolt valminud töödele (ka siis, kui mingil põhjusel ei ole võimalik taastada infot õppija arvutis vms). Õppejõud saab jälgida osalejate tegevuse korrektsus ja õigeaegsust.
E-mail, foorumid on olulised kommunikatsiooni tagamiseks õppijate ja õppejõu vahel ning õppijatele omavahel.

Innovaatilised elemendid:
Õppijad saavad suures ulatuses töötada individuaalselt, ent samal ajal olla vajadusel pidevas kontaktis õppejõuga. Õppija isiklik portfoolio tagab võimaluse kõikide seonduvate materjalide süsteenseks säilitamiseks.

KOMBINEERITUD ÕPIMEETOD

Detailne kirjeldus:
Traditsioonilises vormis loengud ja seminarid on ühendatud virtuaalse koostööga. Kommunikatsiooni ja materjalide jagamist võimaldavad tehnoloogilised vahendid on kursuse toetavateks vahenditeks. Õppijad osalevad auditoorses õppes kord nädalas ja ülejäänud ajal saavad vajadusel suhelda veebipõhiselt.

Palun kirjeldage...
1. Kuidas on kursuse sisu esitatud (kui võimalik, siis esitada ka osakaalud)
☒ Auditoorsed loengud 25%
☒ PowerPoint esitlused 10%
☒ Elektroonilised materjalid veebis, õpihalduskeskkond, täistekstid ja/või slaidid.....%
☐ Videostriiming, videoloengute salvestused, videokonverentsid.....%
☐ Audiostriiming, audioloengute salvestused.....%
☐ Animatsioonid.....%
☐ Graafikud, illustratiivsed tabelid ja pildid .....%
☐ Integreeritud lahendused (nt slaidid kombineeritud audio/video materjalidega) .....%
☐ CD, DVD.....%
☐ Muu: ...%

2. Millised kursuse osad on läbi viidud veebipõhiselt:
☒ Suhtlemine
☐ Rühmatööd
☐ Õpijuhis
☒ Kursuse sisu
☒ Tagasiside andmine, tehniline tugi, kursuse organisatoorne abi
☒ Kursuse korraldusega seotud info (kontakt, läbimise nõuded, oodatavad õpitulemused, jm)
☒ Tööde hindamine
☒ Hindamine
☐ Testid
☐ Enesetestid
☐ Enesehindamine
☒ Lisamaterjalid

ÕPIPROTSESSI KIRJELDUS

Projekti arendustöö käigus õppijad...
1. Tutvuvad standarditega
2. Valmistavad projekti, ajakava ja vajaduste spetsifikatsiooni.
3. Osalevad loengutes
4. Loevad ja analüüsivad teoreetilisi materjale

5. Osalevad veebipõhistes diskussioonides
6. Osalevad seminaridel
7. Koondavad materjalid oma portfooliosse

Palun kirjeldage detailsemalt 2-3 peamist tegevust (meetodit).
A. Õppemeetodi kasutamise eesmärk: harjutada tööoskusi reaalses tarkvara loomisega seotud süsteemis (firmas). Eesmärgiks on suurendada produktiivsust, parandada kvaliteeti ja tagada ajakavast kinnipidamine. Juurutatakse karistuste süsteemi ajakavast kõrvalekaldumisel.
Õppemeetodi kirjeldus
Koostada ettepanek kliendile, kes on tõenäoliselt huvitatud konkreetsest lahendusest. Esita plaan ja vajaduste spetsifikatsioon.
Loodetav tulemus
Õigeaegselt esitatud projekt koos vajaduste analüüsiga.
Ülesande läbiviimise juhend
Analüüsi etteantud materjale, paku välja sobiv näide, analüüsi sarnaseid süsteeme (analoogid). Leia sobiv kirjandus, leia partner, kes on huvitatud selle idee elluviimisest, esita talle oma visioon, uuri kliendi soove ja paku välja endapoolsed ideed.
Produkti pikkus ja vorm
Toote kirjledus (10 lk), vajaduste kirjeldus (20 lk)
Informatsiooni eistamine
Info tuleb esitada õigeaegselt elektrooniselt enda portfoolios ja teade e-maili teel õppejõule ülesande sooritamise kohta.
Hindamiskriteeriumid
Vastavalt õppejõu kehtestatud tingimustele.
Kokkuvõte
Hea projektivisioon ja vajaduste spetsifikatsioon on aluseks edukale projektile.

B. Õppemeetodi kasutamise eesmärk: Oma projekti veenev suuline kaitsmine.
Õppemeetodi kirjeldus
Projektiidee suuline tutvustamine.
Loodetav tulemus
Õppija demonstreerib oma suulise esinemise oskust ja võimet oma ideesid positiivselt välja pakkuda.
Ülesande läbiviimise juhend
Kujuda projekti idee; presentatsiooni käigus oled vastamisi potentsiaalsete klientidega, seega püüa luua mugav atmosfäär. Presetatsioon ei tohi olla liiga pikk, samal ajal peaks see piisavalt selgelt sinu ideesid tutvustama.
Produkti pikkus ja vorm
PowerPoint presentatsioon (vähemalt 10 slaidi)
Informatsiooni eistamine
Presentatsioon (*.ppt) laadida oma portfooliosse ja saata sellekohane teade e-maili teel õppejõule. Määratud ajal toimub projekti kaitsmine teiste tudengite ja komisjoni ees.
Hindamiskriteeriumid
Selge idee presenteerimine; suulise esinemise oskus; PowerPoint vahendi oskuslik kasutamine.

Õppijate hindamine (lõpphinne moodustub järgmistest elementidest (osakaal)):
☒ Aktiivne osalemine kursusel (nii auditoorne kui veebipõhine õpe) 5%
☐ Osalemine foorumidiskussioonides……%
☒ Osalemine seminaridel 20%
☒ Iseseisvate tööde läbimine 50%
☐ Rühmatööde läbimine ……%
☐ Testide tulemused……%
☐ Osalemine kontaktpäevadel……%
☒ Eksam/arvestus 25%

EVALVATSIOONI TULEMUSED

Tulemused:
Hinnatakse esitatud produkti ja selle valmimise protsessi efektiivsust. Hindamise eesmärgiks on kõige efektiivsemate strateegiate ja tehnikate väljaselgitamine järgmiste projektide edasiarendamiseks ja projekti nõrkuste avastamiseks.

Hindamise tulemused:
Hindamise läbiviimise tulemusena on võimalik hinnata tarkvaraprojektide korralduslikku poolt ja inimeste osalemist süsteemis. See teadmine võimaldab paremini korraldada kogu tarkvaraarenduse protsessi.

Nelja mooduli läbimise järel:
- keskmine hinnang kursuse kvaliteedile tuutoritelt 9.72;
- keskmine hinnang kursuse kvaliteedile magistrantidelt 8.33;
- keskmine hinnang tuutorite tegevusele magistrantidelt 8.28;
- keskmine hinnang programmi ülesehitusele magistrantidelt 7.71;
- 43% õppijatest leidis, et kursuse maht on liiga suur, 57% pidas mahtu optimaalseks;
- keskmine hinnang magistrantide praktilisetele oskustele praktikajuhendajatelt ettevõtetes oli väga kõrge – 9.93;
- Ainult 76% õppijatest leidis, et praktika on õppetöö vajalik koostisosa;
- Praktikateema seostus tudengite magistritöö teemaga 62% õppijatest

KONTAKTINFORMATSIOON

Lisainformatsioon:
Metoodilised materjalid:
http://proin.ktu.lt/~kestas/Proj_vald/Kepure.html (leedu keeles)
Tarkvarastandardid:
http://soften.ktu.lt/~virga/mag_atmintine/1sem/standartai.htm
Muu kirjandus: http://soften.ktu.lt/~virga/mag_atmintine/interneteka.html

Kontaktandmed:
Assoc. Prof. K. Motiejunas
e-mail: kestas@soften.ktu.lt
tel.: +370 37 327618, +370 37 454229

Lõpetuseks

Käesolevas kogumikus esitasime lühikese sissevaate kombineeritud õppe maailma. Nii nagu korduvalt mainitud, ei ole ei termin ega ka trend ise enam uus. Ameerika erasfääri koolitustes kasutatakse kombineeritud õppe metoodikat juba pikki aastaid. Kahjuks on Euroopa kõrgharidusruum kõikvõimalike innovaatiliste rakenduste osas sageli skeptiline ja see on ilmselt olnud ka üks kombieeritud õppe valutu ja kiire rakendamise pidurdajaid. Kombineeritud õppe maailm on täis väljakutseid, eriti kui silmas pidada peatseid Euroopa kõrghariduse ees seisvad muudatusi. Selles raamatus käsitlesime nii kombineeritud õppe teoreetilist tausta kui ka näitasime väga praktilist laadi kõrghariduslikku kogemust kombieeritud õppe kasutajailt endilt. Nn uuringuraportid ehk teoreetilisi käsitlusi kirjeldavad ülevaatlikud tekstid kirjeldasid kombineeritud õppe metoodika laialdasi võimalusi ja kogemusi. Käsitlemist leidsid vastusteotsimised nii „Kuidas?" kui ka „Miks?"-küsimustele. Välja toodi nii kombineeritud õppe võimalused ja eelised, samuti nagu ka võimalikud ohud ja tagasilöögid. Ennekõike oli autorite eesmärgiks uuringuraportite esitlemisel anda lühike ülevaade sellest, kuhu kombieeritud õppe rakendamisel tänaseks ikkagi jõutud on.

Raamatu teine pool – praktilised kursuste kirjeldused – tutvustab Euroopa eri riikides reaalselt läbi viidud kombineeritud kursuseid. Näited pärinevad Eestist, Soomest, Norrast, Leedust ja Portugalist. Kõik need kursused pärinevad igapäevasest õppejõudude praktikast ja – isegi kui mitte tingimata parimad kogemused – on need ometi praktilised näited, mis peaksid inustama ka lugejat oma kombineeritud kursuse koostamisega algust tegema. Tahaksime õppejõude innustada otsima väikseid innovaatilisi elemente, mille lisamine senini auditoorsele kursusele annab lihtsa ja õppija poolt aktsepteeritavama lõpptulemuse. Kombieeritud õpe on lihtne ja praktiline! B-Learn projekti meeskond loodab südamest, et tutvustatud teoreetilised ja praktilised ülevaated annavad lugejale vähemalt idee kombineeritud kursuse loomiseks. Ja kui mitte häid ideid, siis vähemalt lõpliku tõuke kombineeritud õppe kasutuselevõtuks peaks lugeja siin raamatus kirjeldatud kogemusest ometi saama. Meie optimistlik lootus on, et käesoleva kogumiku ilmumise järel võib Euroopa kõrghariduses täheldada paljude „uute tulijate" ilmumist, kes usuvad kobineeritud õppesse ja soovivad uute tehnoloogiliste vahenditega eksperimenteerida.

Informatsioon projekti ja partnerite kohta

B-Learn - Assisting teachers of traditional universities in designing blended learning
225565-CP-1-2005-1-EE-MINERVA-M

Algus: 1. oktoober 2005
Kestus: 24 kuud

Veebiaadress
http://www.ut.ee/blearn

B-learn projekti Trac-Wiki
http://trac.htk.tlu.ee/blearn

Kirjuta B-Learn meeskonnale
teadus.blearn.info@lists.ut.ee

[Koordinaator]

UT – Tartu Ülikool (Eesti)
Avatud ülikooli keskus
www.ut.ee/av
Saima Tiirmaa-Oras, saima.oras@ut.ee
Karin Ruul, Karin.ruul@eitsa.ee
Aune Valk, aunevalk@ut.ee
Anne Villems, anne@cs.ut.ee
Lehti Pilt, Lehti.Pilt@ut.ee
Triin Marandi, Triin.Marandi@ut.ee

[Partnerid]

UiB – Bergeni Ülikool (Norra)
Info- ja meediateaduste osakond
http://www.intermedia.uib.no
Konrad Morgan, Konrad.morgan@intermedia.uib.no
Cecilie Hansen, cecilie.hansen@intermedia.uib.no

UoH – Helsinki Ülikool (Soome)
Koulutus- ja kehittämiskeskus Palmenia
http://www.helsinki.fi/palmenia
Jyri Manninen, jyri.manninen@helsinki.fi

UPorto – Porto Ülikool (Portugal)
Inseneriteaduskond, Info- ja kommunikatsioonitehnoloogiate Keskus
http://www.fe.up.pt
Sofia Torrão, storrao@fe.up.pt
Carlos Oliveira, colive@fe.up.pt

TU – Tallinna Ülikool (Eesti)
Haridustehnoloogia Keskus
http://www.htk.tlu.ee
Mart Laanpere, martl@tpu.ee

HSH - Stord/Haugesund Ülikooli kolledž (Norra)
ICT in Education repr. NITOL group (Norway-net with IT for Open Learning)
http://www.hsh.no/nitol
Harald Haugen, harald.haugen@hsh.no
Bodil Ask, bodil.ask@hia.no
Svein Ove Lysne, sveinove.lysne@hsh.no

KTU – Kaunase Tehnikaülikool (Leedu)
Kaugõppe Keskus
http://distance.ktu.lt/en
Danguole Rutkauskiene, danguole.rutkauskiene@ktu.lt
Vilma Mušankovienė, Vilma.Kovertaite@internet.ktu.lt
Vida Motekaytite

EDEN - European Distance and E-Learning Network (Suurbritannia)
http://www.eden-online.org
Ildiko Mazar, mazar@eden-online.org
Andras Szucs, secretariat@eden-online.org

Mišrus Mokymasis:

Tyrimo ataskaita ir gerosios praktikos pavyzdžiai

TURINYS

Padėka

Projektas BLearn buvo sukurtas, norint pasiūlyti mokymosi ir mokymo galimybes, sujungiančias tradicinius mokymosi metodus su naujomis technologijomis paremtais mokymosi metodais. Projekto idėja buvo vystoma, kai įvairių universitetų e. mokymosi personalas buvo pernelyg užimtas, todėl reikėjo padėti universitetų dėstytojams, tokiu būdu edukacinių technologijų specialistai ir kiti žmonės buvo įtraukti į naujų mokymosi galimybių vystymo procesą – mišraus mokymosi kursų kūrimą ir plėtojimą. Integruoti tyrimų ir praktiniai pavyzdžiai suteikia puikų pagrindą pradėti permainas universitetuose pagal šiuo tyrimu paremtą aprašymą. Įvairūs pasiūlymai pateikiami tolesniuose puslapiuose.

Šio leidinio autorės, Sofia Torrao iš Porto universiteto ir Saima Tiirmaa-Oras iš Tartu universiteto, nori padėkoti dalyviams, prisidėjusiems prie BLearn projekto. Mūsų partneriai:

Jyri Manninen iš Helsinkio universiteto Palmenia tęstinio mokymosi centro;

Cecilie Hansen ir Konrad Morgan iš Bergeno universiteto Informatikos mokslų katedros;

Mart Laanpere iš Talino universiteto;

Harald Haugen, Bodil Ask ir Svein-Ove Lysne iš Stord/Haugesund universiteto IKT švietime kolegijos, NITOL grupės (Norway-net, IT atviras mokymasis);

Ildiko Mazar, atstovavusi Europos nuotolinio ir e. mokymosi tinklą;

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Šis leidimas parengtas ir išleistas Socrates Minerva BLearn projekto „ Assisting teachers of traditional universities in designing blended learning

(225565-CP-1-2005-1-EE-MINERVA-M)“ metu. Projektą finansavo Europos komisija ir visi partneriai.

Leidinio įvadas

Naujas požiūris į mišrųjį mokymąsi

Mielas skaitytojau,

Šis leidinys pristato atvejų, studijų ir tyrimų, atliktų mišraus mokymosi (angl. blended learning) srityje sintezę – geruųjų praktikų ir teorinių žinių rinkinį. Terminas „mišrus mokymasis" pirmą kartą buvo panaudotas amerikiečių literatūroje ir reiškė tradicinio mokymo ir technologijomis paremto mokymo junginį, kuriame taikomi įvairūs pedagoginiai metodai ir skirtingos technologinės formos.

(Gynther 2005). Šio termino koncepcija ir suvokimas apima daugiau nei vieną mokymosi teorijos sritį. Pagrindinis apibendrinimas, kurį galima padaryti – mišrų mokymąsi sunku apibrėžti kaip vieną idėją. Galima suvokti šią sritį keliais būdais. Tai rodo, kad egzistuoja daugybė skirtingų tiriamų aspektų. Taigi mišrus mokymasis yra vienas metodas, naudojamas kituose pedagoginiuose modeliuose.

Mišrus mokymasis dažniausiai suvokiamas kaip būdas sujungti mokymąsi auditorijoje ir technologijomis paremtą mokymąsi, nors naudojami skirtingi mišraus mokymosi įdiegimo į mokymo procesą modeliai. Pagrindinė prieiga – kaip sujungti du skirtingus metodus į vieną. Svarbiausias teisingos prieigos radimo aspektas yra visų galimybių, privalumų ir skirtingų detalių kontaktiniame („akis į akį"- angl. face to face) mokymesi ir technologijomis paremtame mokymesi apsvarstymas.

Mišrus mokymasis nėra naujas metodas. Nauja yra tai, jog mišriajame mokymesi galima pasirinkti junginio komponentų. Institucijos turi nuspręsti pagal pasirinktus kriterijus, kaip šie komponentai turėtų būti derinami, kad duotų vaisių, pastoviai išlaikant balansą tarp kontaktinio mokymo ir technologinių komponentų. Kuriant, vystant ir pristatant skirtingus junginių tipus – sudedamuosius, integruotuosius, bendruosius ar atviruosius – svarbiausia susitelkti į mokymosi rezultatus. Tai reikia ištirti atsižvelgiant į

į besimokančiuosius, mokymosi kultūrą, mokymosi resursus, elektroninę infrastruktūrą, pasiūlyto sprendimo pasiekiamumą ir palaikymą. Mišraus mokymosi projektas buvo sukurtas tam, kad pasiūlytų būdus, kaip integruoti naujų technologijų siūlomus mokymo ir mokymosi metodus į tradicines strategijas. Pagrindinė mintis yra suteikti galimybę pristatyti naujas novatoriškas idėjas mokytojams tradiciniuose universitetuose ir mokyti lengvu bei prieinamu būdu. Projekto metu buvo atliktas tyrimas ir išnagrinėti praktiniai pavyzdžiai, kurie suteikia pagrindą pradėti permainą universitetų pedagogikoje.

Šiame leidinyje pateikiami mišraus mokymosi penkių Europos šalių universitetuose pavyzdžiai. Šių pavydžių pagalba mes norime atkreipti dėmesį į tai, kur gali būti naudojamas mišrus mokymasis. Šiame vadove taip pat pateikiamos keturios tyrimų ataskaitos, kurios apibrėžia skirtingas mišraus mokymosi teorijas, pavyzdžius, kaip mišrus mokymasis galėtų būti integruotas į tradicinius Europos universitetus, skirtingų tyrimų projektų pavyzdžius ir mišraus mokymosi panaudojimo komercinėje aplinkoje būdus.

Projekto partneriai tiki, kad šis įvadas į mišraus mokymosi modelius, teorijas ir geriausias praktikas paspartins mišraus mokymosi tradiciniuose universitetuose plėtrą, pasiūlydamas plačias tradicinių mokymosi metodų ir technologijų derinimo įžvalgas. Svarbiausios tikslinės grupės yra mišraus mokymosi vartotojai (mokytojai, moksleiviai, mokymų projektuotojai, edukacinių technologijų specialistai) daugiausiai iš aukštojo mokslo institucijų, bet taip pat ir iš kitokio tipo institucijų.

Mes norime padėkoti visiems žmonėms, kurie dirbo drauge su mumis rinkdami ir sistemindami duomenis šiam leidiniui. Ypatingai ačiū visiems dėstytojams, kurie leido analizuoti savo mišraus mokymosi kursus ir tokiu būdu suteikė mūsų skaitytojui galimybę gauti naudos iš jų patirties.

Mišraus mokymosi teorijos

Įvadas

Šis leidinys apžvelgia pagrindinę mišraus mokymosi literatūrą. Ataskaita padalinta į tris dalis, kiekviena iš jų išskiria skirtingą šio fenomeno aspektą. Pradžioje aiškinami skirtingi mišraus mokymosi apibrėžimai ir aprašymai. Antrojoje dalyje apžvelgiamos įvairios pedagoginės mišraus mokymosi teorijos. Trečiojoje dalyje pristatomos kelios mišraus mokymosi kaip mokomojo metodo prieigos. Pagrindinė literatūros apžvalgos išvada - mišrų mokymąsi sunku apibrėžti kaip vieną idėją. Galima suvokti šią sritį keliais būdais, o to pasekmė yra daugybė skirtingų tiriamų aspektų.

„Mišrus mokymasis“ – kas tai?

Apie mišraus mokymosi teoriją parašyta daugybė straipsnių ir knygų. Pats terminas nurodo į skirtingus mokymo ir mokymosi aspektus. Studijuojant terminą, akivaizdu, kad nėra vienintelio apibrėžimo ar prieigos. Kita savybė, būdinga šiam fenomenui – „mišrus mokymasis“ (angl. blended learning) neturi aiškių vertimų kitose kalbose. Taigi galima kelti klausimą, ar atvejai tiriantys panašius klausimus, neapibrėžtus kaip mišrus mokymasis, vis dar kalba būtent apie mišrų mokymąsi. Jei tyrimai atitinka mišraus mokymosi apibrėžimą, galima atsakyti į šį klausimą teigiamai. Apibrėžti tyrimą nenaudojant paties termino būtų milžiniška metodologinė užduotis, taigi šis leidinys bus paremtas tik tais tyrimais, kurie mini mišraus mokymosi terminą.

Kaip ir dauguma kitų autorių, Gynther (2005) teigia, kad anksčiau egzistavęs atotrūkis tarp tradicinio ir tinkle vykstančio, nuotolinio, virtualaus mokymosi nyksta. Netrukus visi mokymai bus daugiau ar mažiau skaitmeniniai arba remsis lanksčiomis edukacinės organizacijos galimybėmis.

Virtuali dimensija jau integruota į visų rūšių švietimą, su ja arba vis dar eksperimentuojama, arba mokymas jau įgyvendinamas tokiu būdu. Terminas „mišrus mokymasis“ yra amerikietiškos kilmės. Jis reiškia tradicinio mokymo ir technologijomis paremto mokymo junginį, kuriame naudojami įvairūs pedagoginiai metodai ir skirtingos technologinės formos.

Josh Bersin‘o (2004) knyga „Mišraus mokymosi vadovas: geriausios praktikos, įrodyta metodologija ir išmoktos pamokos“ pateikia mišraus mokymosi kaip skirtingos mokymo terpės (technologijos, veikla ir įvairūs įvykiai), skirtos pasiekti optimalų mokymo rezultatą specifinėje auditorijoje, apibrėžimą. Bersin naudoja terminą „mišrus mokymasis“ kaip tradicinį mokytojo vadovaujamą mokymą, papildytą elektroniniais formatais, kai mišraus mokymosi programos naudoja daugybę skirtingų e. mokymosi formų, kartais papildytų mokytojo vadovaujamu mokymu ir kitais „gyvais“ formatais.

Daug autorių, naudojančių „mišraus mokymosi“ terminą, rašo vadovus „kaip daryti“, dažniausiai įmonėms. Ir Bersin yra šioje kategorijoje, o taip pat Kaye Thorne (2003), kuris laiko mišrų mokymąsi logiškiausia ir natūralia mokymosi evoliucija. Jis teigia, kad mišrus mokymasis yra elegantiškas atsakas į prie individualių poreikių pritaikyto mokymosi ir vystymosi iššūkius, reprezentuojantis galimybę integruoti į tradicinį mokymąsi novatorišką technologinę pažangą , kurią siūlo online mokymasis su savo interaktyvumu ir dalyvavimu. Jis gali būti palaikomas ir stiprinamas asmeniniais akis į akį kontaktais.

Thorne’o knygoje „Mišrus mokymasis: kaip integruoti online ir tradicinį mokymąsi“ mišrus mokymasis apibrėžiamas kaip tradicinių mokymo klasėse ir kontaktinių formų junginys su:
• Daugialypės terpės technologijomis
• CD ROM video srautu
• Virtualioms klasėmis

Kaip minima aukščiau, dauguma mišraus mokymosi srities knygų yra parašyta „kaip daryti“ prieiga, jų pagrindinė auditorija yra privačios įmonės, įstaigos bei institucijos ir jos kalba apie tai, kaip įmonės galėtų padaryti mokymus efektyvesnius, mažiau kainuojančius ir reikalaujančius mažiau laiko. Šiose knygose kreipiamasi į skaitytoją neformaliu, neakademiniu stiliumi, naudojamos tokios frazės kaip „Kaip tai gali padėti?“, „Ar tai tinkama tavo organizacijai?“, „Kaip tai įgyvendinti?“ Jos propaguoja mišrų mokymąsi kaip mokymo metodą įmonėms. Čia mišrus mokymasis yra triukšmingai reklamuojamas, jis yra naujas ir išsprendžia beveik visas mokymo problemas.

Be „kaip daryti“ knygų, žinoma, yra ir keletas akademinių straipsnių, kalbančių apie šį terminą. Whitelock ir Jelfs (2003) išleido specialų žurnalo numerį, skirtą mišriam mokymuisi, kuriame pristatomi trys termino apibrėžimai. Jie sako, jog mišrus mokymasis yra

1. integruota tradicinio mokymosi ir tinkle esančių, online prieigų kombinacija;
2. e. mokymosi aplinkos terpės ir priemonių kombinacija;
3. įvairių pedagoginių prieigų, nepriklausomų nuo mokymosi technologijos, kombinacija.

Pirmasis iš apibrėžimų, suformuluotas Singh (2003 Oliver ir Trigwell 2005) yra naudojamas dažniausiai. Antrasis taip pat plačiai paplitęs, nors kartais palaikomas daug bendresne forma, turintis ryšį su įvairiais modeliais, ne tik teikiantis pirmenybę e. mokymuisi. Oliver ir Trigwell teigia, kad Singh pateikia svarbesnį aprašymą, kuris detalizuoja trečiąją galimybę, paremtą tuo, ką jis laiko daug geresniu mokymosi strategijų arba dimensijų rinkiniu, ir kas gali būti sujungta įvairias būdais, tokiais kaip offline ir online; savarankiškumas ir bendradarbiavimas; struktūruota ir nestruktūruota; vartotojo turinys ir standartinis turinys; ir t. t.

Kitą prieigą pristato Kerres ir De Witt (2003). Jie apibrėžia mišrų mokymąsi kaip skirtingų mokomųjų metodų ir pristatymo formatų junginį. Jų argumentacija remiasi prielaida, kad šie du dalykai yra priklausomi vienas nuo kito.

Oliver ir Trigwell mini visus šiuos straipsnius, bet taip pat kalba apie Driscoll knygos santrauką (2002), kurioje ji identifikuoja keturias skirtingas „koncepcijas“, nurodomas šiuo terminu:

1. tinklu besiremiančių technologijų derinimas arba jungimas edukaciniams tikslams pasiekti;
2. pedagoginių prieigų derinimas (pvz., konstruktyvizmas, biheviorizmas, kognityvizmas) optimaliam mokymuisi sukurti;
3. rezultatai su arba be mokomosios technologijos;
4. bet kokios formos mokomosios technologijos ir akis į akį mokytojo vadovaujamo mokymosi derinimas;
5. mokomosios technologijos ir aktualių darbo užduočių derinimas.

„Esmė tame, kad mišrus mokymasis reiškia skirtingus dalykus skirtingiems žmonėms, kas iliustruoja jo didelį nepanaudotą potencialą“ rašo
Driscoll (Oliver ir Trigwell 2005). Oliver ir Trigwell nurodo tikslesnį Hofmann (2001) pasiūlytą apibrėžimą.

Ji siūlo, kad „idėja, glūdinti už mišraus mokymosi yra tai, kad jo projektuotojai peržiūri mokymosi programą, sudeda ją į modulius ir apibrėžia geriausias priemones, kaip šiuos modulius pristatyti besimokančiajam“.

Oliver ir Trigwell pristato ir vieną iš paskutiniųjų perspektyvų, kurią pateikė Valiathan (2002), aprašančią junginius terminais, susitelkiančiais ties mokymusi arba „numatomu“ mokymusi:

1. įgūdžiais besiremiantis mokymasis, kuris derina savarankišką mokymąsi su mokytojo ar kuratoriaus pagalba, kad būtų vystomos specifinės žinios ir sugebėjimai;
2. požiūriu besiremiantis mokymasis, kuris jungia įvairius įvykius ir pristatymo terpę, kad būtų vystoma specifinis elgsena;
3. kompetencija besiremiantis mokymasis, kuris derina pasirodymo palaikymo priemones ir žinių valdymo resursus bei kuravimą, kad būtų vystoma darbo vietos kompetencija.

Oliver ir Trigwell kritiškai žiūri į „mišraus mokymosi“ termino naudojimą visuose šiuose kontekstuose, nes jie teigia, kad visiems šiems pavyzdžiams bendra savybė yra ta, kad jie visi aprašomi iš mokytojų, kuratorių ar kursų projektuotojų pozicijų.

Pagrindinis šio tyrimo rezultatas, taikant Oliver ir Trigwell (2005), Whitelock ir Jelfs (2003) ir kitų autorių straipsniuose pateikiamą mišraus mokymosi apbrėžimą, rodo, kad koncepcija ir termino suvokimas mokymosi teorijoje nėra vienodi.

Mokymosi teorija

Kitas mišraus mokymosi aspektas yra pedagoginių teorijų prieiga. Mišraus mokymosi teorija neatrodo „priklausanti“ vienai mokymosi teorijai, bet greičiau yra metodas, naudojamas skirtingose pedagoginėse prieigose. Šiame straipsnyje, aprašant mišrų mokymąsi, taikomos skirtingos pedagoginės teorijos (Oliver ir Trigwell 2005, Whitelock ir Jelfs 2003). Hiltz ir Murray (2005) pristato online mokymąsi kaip naujausią priemonę ilgame socialinių technologijų sąraše, kuris buvo pristatytas siekiant pagerinti nuotolinį mokymąsi, pridedant įvairius papildymus arba derinant naujas pedagogines prieigas ir technologijas.

Autoriai mato online mokymosi sukeltą revoliuciją aukštajame moksle tiek kaip procesą, tiek kaip socialinį institutą. Jie aprašo online mokymąsi kaip naują socialinį procesą, kuris pradeda veikti kaip visiškas tiek nuotolinio mokymosi, tiek akis į akį mokymo substitutas. Pakeičiami abu, nes tai procesas, kurio metu infiltruojamos įprastos kontaktinės pamokos ir tai radikaliai keičia tai, kaip paprastai įsivaizduojamas tipinis kursas.

Roberts (2004) pabrėžia kad „mišrus mokymasis“ pastaruoju metu tapo madingas ir pakeičia tradicines paskaitas bei seminarus, suteikdamas galimybę besimokantiesiems dirbti efektyviai. Jis nurodo dvi tendencijas, būdingas visiems, įtrauktiems į mokymosi procesą. Pirma, jis aprašo didžiulį tinkle esančia medžiaga paremtų kursų kiekio augimą. Antra, dauguma pedagogų laiko bendravimą svarbiausiu mokymosi proceso komponentu daugumai besimokančiųjų. Roberts teigia, kad kompiuterių palaikomas bendras mokymasis yra mėginimas pašalinti atotrūkį tarp bendravimo ir mokymosi, ir turėtų būti laikomas išsiskiriančiu dvidešimt pirmojo amžiaus mokymosi pavyzdžiu.

Thorne (2003) laiko mišrų mokymąsi būdu labiau individualizuoti mokymąsi, remiantis Haward Gardner – žmonės pozityviai reaguoja į skirtingus mokymosi stimulus. Tokiu būdu organizacijos ir mokyklos gali pateikti žmonėms skirtingus darbo metodus, suteikiant jiems laisvę būti patiems savimi. Kita plačiai naudojama pedagoginė prieiga yra veiklos teorija ir socialinio konstruktyvaus mokymosi teorija (Bjarno 2005).

Taradi ir kiti (2005) pristato mišrų mokymąsi kaip vieną iš trijų edukacinių galimybių aukštajame moksle. Šie trys pedagoginiai

principai yra tinklu paremtas mokymasis (WBL), problema paremtas mokymasis (PBL) ir bendras mokymasis. Taradi pateikia tokį mišraus mokymosi apibrėžimą – mišrus (hibridinis) kursas yra toks, kuris suderina tradicines kontaktines ir WBL prieigas edukacinėje aplinkoje, kuri nėra specifinė laiko ar vietos atžvilgiu.

Alonso ir kiti (2005) pasigenda pastangų surasti psicho-pedagoginių problemų sprendimus naujoje edukacinėje kategorijoje ir teigia, kad psicho-pedagoginis mokymo modelis yra naujausias informacijos apdorojimo būdas psichologijoje ir socialiniame konstruktyvizme. Autorius nurodo mišrią mokymosi proceso prieigą. Technologiškai kalbant, mokymo modelis yra palaikomas mokymosi objektų, koncepcija paveldėta iš į objektą orientuotos paradigmos.

Gynther (2005) išskiria keturis mišraus mokymosi keliamus klausimus:

1. Kokio pobūdžio žinias besimokantieji turėtų gauti ir kokia pedagoginė forma reikalinga mokymosi procesui organizuoti?
2. Kokia turi būti mokymosi klasė?
3. Kokia turi būti mokymosi aplinka?
4. Kokios rūšies mokymosi resursai gali būti sukurti atsižvelgiant į tavo pasirinkimą?

Terminas „mišrus mokymasis“ plačiausia prasme reiškia tradicinių technologijų ir tinklu paremtų mokymo technologijų junginį. Gynther teigia, kad amerikietiškas šio termino suvokimas labai paplitęs ir mano, kad jis pasitarnauja terminui susieti su konkrečiu mokomuoju metodu. Jis taip pat prideda, kad aukščiau minimus klausimus mokytojai turėtų užduoti patys sau, kai kuria naujus mokymo modelius.

Gynther (2005) mano, jog mišraus mokymosi terminas nurodo ne tik į junginį tarp technologinio ir tradicinio mokymo klasėje, bet taip pat liečia tai, ko mokomasi ir kokie pedagoginiai metodai, kokios rūšies technologijos, kurios skatina mokymąsi, ir kokios skirtingos žinių formos naudojamos mokyme. Svarbu surasti technologinius sprendimus, kurie palaiko skirtingas mokomąsias galimybes. Kontaktinis bendravimas šiandien yra tik vienas iš būdų organizuoti mokymą ir mokymąsi. Autorius aprašo, kaip ateities edukacinė rinka daro naujo tipo spaudimą edukacinėms institucijoms dėl naujo tipo švietimo, dalykų ir naujo tipo besimokančiųjų. Naujo tipo besimokantieji reikalauja lankstaus švietimo projektavimo, kuriame kreipiamas dėmesys į naujus vartotojus. Tai taip pat turi pasekmių mokymosi projektavimui.

Išvada – mišrus mokymasis nėra viena mokymosi paradigma, bet greičiau mokymosi būdas, naudojamas kituose pedagoginiuose modeliuose. Todėl būtų teisingiau pristatyti mišrų mokymąsi kaip pedagogikos metodą.

Mišraus mokymosi prieigos

Nuo tada, kai mišrus mokymasis suvokiamas kaip kontaktinio ir technologijomis paremto mokymo junginys ir toliau aprašomas kaip viena iš pedagoginių prieigų, būtų įdomu apžvelgti skirtingas prieigų rūšis, jungiančias kontaktinį ir technologijomis paremtą mokymą. Hiltz ir Murray (2005) nustato, kontaktiniai kursai meistriškai sujungti su online mokymosi technologijomis ir metodologija dažniausiai vertinami besimokančiųjų kaip reikšmingas tradicinio mokymosi klasėje patobulinimas, bet šios permainos greitis priklauso nuo socialinių faktorių.

Bersin (2004) siūlo du konkrečius modelius ir teigia, kad mišraus mokymosi tikslas yra sujungti akis į akį vykstantį mokymą ir technologijomis paremtą mokymą į vieną bendrą visumą. Visų pirma, technologijos gali papildyti tradicinę mokymosi programą, antra, tradicinė programa gali papildyti technologijomis paremtą mokymą, kai trūksta socializacijos proceso, o studentams trūksta motyvacijos bei užsidegimo tęsti pradėtas studijas. Taip mąstydamas Bersin daro išvadą apie du bendrus mišraus mokymosi modelius:

1. „Programos srauto“ modelis: žingsnis po žingsnio vykdomas mokymo planas, kuris integruoja keletą terpių į chronologinę programą. Skyriai išdėstomi vienas po kito. Baigiama pratimais arba vertinimu tam, kad būtų išmatuotas visas mokymasis. Šį modelį galima lyginti su kolegijos ar aukštosios mokyklos kursais.
2. „Pagrindo ir pakopos“ modelis: viena pagrindinė mokymo prieiga (online klasės mokymas arba tinkle esanti kursų medžiaga) su kita medžiaga, veikla, resursais ir vertinimais kaip „pagalbine medžiaga, privaloma arba neprivaloma, kuri apima ir papildo pagrindinę prieigą“.

Pirmoji prieiga sukuria tiek aukšto lygio dalyvavimą, tiek aukštą įvykdymo greitį. Dėl to besimokantieji jaučiasi įtraukti ir gali planuoti savo mokymosi laiką. Bersin teigia, kad ši prieiga taip pat leidžia besimokantiesiems atrasti laiko mokymams savo tvarkaraštyje ir tuo pačiu metu verčia juos tęsti iki galo. Prieiga suteikia mokytojams galimybę sekti progresą ir pamatyti kylančias problemas. Bersin laiko šią prieigą puikiai tinkančia mokymui auditorijoje ar klasėje. Ji tinka daugumai mokomųjų paradigmų (mokytis/bandyti/vertinti). Taip pat ji naudinga atestavimo programose, be to ją lengva modifikuoti ir išlaikyti.

Antroji, Bersin‘o aprašyta, prieiga yra sukurta vienam kursui, naudojančiam vienintelę terpę (elektroninę arba realią), pritaikančią kitą terpę arba mokymosi veiklą kaip pasirenkamą arba papildomą medžiagą. Besimokantieji patys nusprendžia, kurią papildomą medžiagą naudoti ir jiems visiems nereikia užbaigti kurso tuo pačiu metu. Šioje prieigoje daroma prielaida, kad besimokantieji yra motyvuoti ir savarankiški. Šitas modelis pagreitina vystymosi procesą, kadangi su mokymu susijusi medžiaga gali būti formuojama visą laiką.

Kaip minėta ataskaitos pradžioje, Valiathan (2002) pristato kitą prieigą, kurią jis padalina į tris: įgūdžiais besiremiantis mokymasis, kuris derina savarankišką mokymąsi su mokytojo ar kuratoriaus pagalba, kad būtų vystomos specifinės žinios ir sugebėjimai, požiūriu besiremiantis mokymasis, kuris jungia įvairius įvykius ir pristatymo terpę, kad būtų vystomas specifinis elgesys ir kompetencija besiremiantis mokymasis, kuris derina pasirodymo palaikymo priemones ir žinių valdymo resursus bei kuravimą, kad būtų vystoma darbo vietos kompetencija. Petra Neumeier (2005) studijavo kalbos mokymąsi projektavimo, rašymo ir CALL palaikomos medžiagos įgyvendinimo kurse. Ji mano, kad kurso projektuotojams reikia parametrų rėmų, kurie leistų jiems apsispręsti dėl individualaus, su kontekstu susieto mišraus mokymosi įgyvendinimo. Norėdama pasiekti geresnį faktorių, kurie formuoja praktiką ir mišraus mokymosi patirtį, supratimą, ji pristato keletą parametrų, formuojančių mišraus mokymosi aplinką.

Gynther (2005) mini didėjančią geresnio ir pigesnio švietimo paklausą. Daugumai tai susiję su informacinėmis technologijomis, kadangi jos suteikia galimybę siekti naujų ir efektyvesnių mokymosi rezultatų. Bet mokymosi rezultatai ir galimi technologijų naudojimo privalumai turi būti studijuojami taip pat plačiai kaip ir tradicinis mokymas bei mokymasis.

Pradedant mišrų mokymąsi reikia apsvarstyti keletą aspektų:

1. Kokių privalumų turi kontaktinis mokymas?
2. Kokios problemos kyla dėl bendravimo virtualiose klasėse?
3. Kokiems aspektams mokytojas turėtų teikti pirmenybę kontaktiniame mokyme ir kokiems mokyme internetu?

4. Kaip paskirstyti prioritetus tarp skirtingų terpių ir terpių formomis paremto mokymo?

Svarbiausia būti budriems dėl iškylančių problemų ir apsvarstyti dalykus iš anksto. Kiekviena priemonė turi privalumų ir trūkumų. Ji gali tiek palaikyt, tiek apriboti bendravimą tų, kurie atsiduria mokymo/mokymosi situacijose.

Renkantis mišraus mokymosi prieigą, kuri bus įgyvendinama mokyme, Gynther siūlo apsvarstyti tokius dalykus:

1. Ar terpė suteikia galimybę besimokančiajam bendrauti su mokytoju?
2. Ar terpė suteikia galimybę mokytojui stebėti besimokančiųjų bendravimą?
3. Ar terpė suteikia besimokančiajam galimybę stebėti kitų besimokančiųjų reiškiamą suvokimą apie studijas?
4. Ar terpė suteikia besimokančiajam galimybę stebėti savo paties išreikštą studijų supratimą?
5. Ar terpė suteikia galimybę diferencijuoti informacijos ir bendravimo būdų pasirinkimą?
6. Ar terpė suteikia mokytojui galimybę organizuoti bendravimą tarp mokytojų ir moksleivių? Ar galima stebėti, kaip vyksta darbas grupėse ir projektiniuose darbuose?
7. Kaip skirtingos terpės naudojimas ir bendravimas formuojasi kartu mokymosi aplinkoje?

Anot autoriaus, mišrus mokymasis suteikia mokytojams skirtingus informacijos perdavimo būdus. Tokiu būdu besimokantieji išvysto geresnius informacijos supratimo sugebėjimus ir mišrus mokymasis pateikia naujas bendravimo formas bei mokymo galimybes. Besimokantieji, turintys skirtingą pradinį pasirengimą gali įsisavinti daugiau informacijos.

Yra daug skirtingų prieigų, kaip įdiegti mišrų mokymąsi į mokymo procesą. Kai kurios iš jų buvo apžvelgtos šiame skyriuje. Nuo tada, kai mišrus mokymasis suvokiamas kaip kontaktinio ir technologijomis paremto mokymo junginys, pagrindinė prieiga yra kaip šiuos du modelius integruoti į vieną visumą. Nepaisant modelių struktūros, prieigos remiasi vienos ar kelių terpių integravimu. Derinamas savarankiškas mokymasis ir mokytojo ar kuratoriaus pagalba. Galima rinktis tarp chronologinės arba atsitiktinės programos, dažnai besibaigiančios pasirenkamu arba privalomu įvertinimu mokymuisi pamatuoti. Pagrindinis aspektas pasirenkant teisingą prieigą yra galimybių, privalumų ir prioritetų apsvarstymas kontaktiniame ir technologijomis paremtame mokyme.

Santrauka

Pagrindiniai šio tyrimo rezultatai, taikant Oliver ir Trigwell (2005), Whitelock ir Jelfs (2003) ir kitų autorių straipsniuose pateikiamą mišraus mokymosi apbrėžimą, rodo, kad koncepcija ir termino suvokimas mokymosi teorijoje nėra homogeniški.

Kita išvada – mišrus mokymasis nėra viena mokymosi paradigma, bet greičiau pristatymo būdas, naudojamas kituose pedagoginiuose modeliuose. Todėl būtų teisingiau pristatyti mišrų mokymąsi kaip pedagogikos metodą.

Egzistuoja skirtingos mišraus mokymosi įdiegimo į mokymo procesą prieigos. Šiame leidinyje apibrėžiamos kelios iš jų. Nuo tada, kai mišrus mokymasis suvokiamas kaip akis į akį vykstančio ir technologijomis paremto mokymo junginys, pagrindinė prieiga yra kaip šiuos du modelius integruoti į vieną visumą. Nepaisant modelių struktūros, prieigos remiasi vienos ar kelių terpių integravimu. Derinamas savarankiškas mokymasis ir mokytojo ar kuratoriaus pagalba. Galima rinktis tarp chronologinės arba atsitiktinės programos, dažnai besibaigiančios pasirenkamu arba privalomu įvertinimu mokymuisi pamatuoti. Pagrindinis aspektas pasirenkant teisingą prieigą yra galimybių, privalumų ir prioritetų apsvarstymas akis į akį mokyme ir technologijomis paremtame mokyme.

Pagrindinė literatūros apžvalgos išvada - mišrų mokymąsi sunku apibrėžti kaip vieną idėją. Galima suvokti šią sritį keliais būdais, o to pasekmė yra daugybė skirtingų tiriamų aspektų.

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Strategijų, kaip mišrus mokymasis galėtų būti integruotas į tradicinius Europos universitetus, pavyzdžiai

Įvadas

Šioje ataskaitoje nagrinėjamos strategijos, kaip mišrus mokymasis galėtų būti integruotas į tradicinius Europos universitetus. Leidinyje apžvelgiami kitų projektų, kurie įtraukė mišrų mokymąsi į tradicinius universitetus, pavyzdžiai. Pirma pateikiami mišraus mokymosi termino naudojimo apibrėžimai, po to mokytojų rengimo strategijų, kalbos mokymo, sveikatos švietimo strategijų, socialinių ir humanitarinių mokslų ir galiausiai inžinerijos bei gamtos mokslų mokymo pavyzdžiai.

„Mišrus mokymasis“ – trumpas pristatymas

Terminas „mišrus mokymasis“ plačiausia prasme reiškia tradicinių technologijų ir tinklu paremtų mokymo technologijų junginį. Whitelock ir Jelfs (2003) išleido specialų žurnalo numerį, skirtą mišriam mokymuisi, kuriame pristatomi trys termino apibrėžimai:

1. integruota tradicinio mokymosi ir tinkle esančių, online prieigų kombinacija;
2. e. mokymosi aplinkos terpės ir priemonių kombinacija;
3. įvairių pedagoginių prieigų, nepriklausomų nuo mokymosi technologijos, kombinacija.

Pirmasis iš apibrėžimų, suformuluotas Singh (2003 Oliver ir Trigwell 2005) yra dažniausiai pateikiama interpretacija.

Jei mišrus mokymasis naudojamas kaip metodas edukacinėse institucijose, danų teoretikas Gynther (2005) išskiria keturis mišraus mokymosi keliamus klausimus:

1. Kokio pobūdžio žinias moksleiviai turėtų gauti ir kokia pedagoginė forma reikalinga mokymui organizuoti?
2. Kokia turi būti mokymosi klasė?
3. Kokia turi būti mokymosi aplinka?
4. Kokios rūšies mokymosi resursai gali būti sukurti atsižvelgiant į tavo pasirinkimą?

Šiuos klausimus autorius laiko svarbiausiais, juos mokytojai turėtų apvarstyti, kurdami naujus mokymo modelius.

Iš kitos pusės, Bersin (2004) didžiausia problema mokytojo vadovaujamame mokyme laiko masto problemą. Beveik neįmanoma išmokyti tūkstančių moksleivių, kas dažniausiai ir atsitinka universitetuose, taikant vienas su vienu mokymą, ir perduoti patirtį. Kita problema yra laikas. Būdas, kuriuo dažniausiai sprendžiamos šios problemos institucijose, yra technologijų įdiegimas į mokymą. Bersin tiki, kad mišrus mokymasis gali išplėsti mokymo modelį erdvėje ir laike. Tokiu būdu mišrus mokymasis gali būti taikomas didesniam besimokančiųjų skaičiui. Mišrus mokymasis yra ne tik metodas, padedantis sutaupyti dėstytojų laiką ar studentų laiką, bet taip pat ir galimybė priimti į akademines programas daugiau besimokančiųjų (Cottrell ir Robison 2003).

Ši mišraus mokymosi interpretacija gali turėti didžiulę įtaką socialinei struktūrai. Ne tik daugiau besimokančiųjų galima priimti į aukštojo mokslo įstaigas, bet ir, kaip sako Aspden ir Helm (2004), virtualios mokymosi aplinkos (VLE) pristatymas universitetų teritorijoje gali pakeisti egzistuojančias mokymosi ir mokymo santykio dimensijas. Daugiau moksleivių nereikš mažiau kontakto su mokytojais ir personalu. Tyrimo literatūra rodo, kad padidėjęs įsitraukimas

į edukacines technologijas gali suartinti personalą ir moksleivius (tiek fiziškai, tiek virtualiai) labiau nei universiteto teritorijoje

esančios institucijos. Universiteto teritorijoje besimokantieji gali gauti naudos iš naudojimosi technologijomis, kurios leidžia jiems jaustis vis labiau susietiems su jų institucijomis ir kitais besimokančiaisiais. Technologija gali padėti sukurti fizinį ryšį tarp besimokančiųjų ir institucijų – net kai sąveika tarp besimokančiųjų vyksta „offline“ – ir fizinės bei virtualios mokymosi aplinkos kombinacija gali sukurti efektyvią mokymosi ir mokymo patirtį.

Kiti autoriai teigia, kad mišrus mokymasis nėra naujas fenomenas. Kas nauja, tai absoliutus galimų junginio komponentų pasirinkimas. Svarbiausia nuspręsti pagal pasirinktus kriterijus, kaip šie komponentai turėtų būti derinami. Tai vienintelis būdas sukurti produktyvius junginius. Reikia sutelkti dėmesį į mokymosi rezultatus ir į besimokančiuosius, mokymosi kultūrą, mokymosi resursus, elektroninę infrastruktūrą, pasiūlyto sprendimo pasiekiamumą ir palaikomumą, kuriant, vystant ir pristatant skirtingų tipų junginius. Didėjantis pasirinkimas nėra tikslas savaime. (Clark 2005).

Dauguma mišraus mokymosi srities knygų parašytos „kaip daryti“ prieiga. Didžioji dalis jų skirta mokymams įmonėse (žr. Bersin 2004, Thorne 2003 ir McGinnis 2005). Pagrindinė jų tikslinė grupė yra įmonės ir dėmesys sutelkiamas į tai, kaip įmonėms parengti efektyvesnius, pigesnius ir mažiau laiko reikalaujančius mokymus. Mišrus mokymasis vaizduojamas kaip naujas fenomenas, kuris išsprendžia beveik visas mokymo problemas. Šiose knygose kreipiamasi į skaitytoją neformaliu, neakademiniu stiliumi, naudojamos tokios frazės kaip „Kaip tai gali padėti? Ar tai tinkama tavo organizacijai? Kaip tai įgyvendinti?“ ir jos propaguoja mišrų mokymąsi kaip mokymo metodą, naudojamą organizacijose.

Sunku surasti šios rūšies „kaip daryti“ sprendimus tradicinėje akademinėje literatūroje. Akademinė literatūra remiasi projektais, kuriuose tiriamas mišrus mokymasis. Pagrindinis šių projektų tikslas yra išsiaiškinti, ar mišrios terpės įdiegimas turi įtakos mokymosi rezultatams (žr. Taradi ir kt. 2005, Bjarno 2005, Neumeier ir kt. 2005,
Voogt ir kt. 2004 ir Concannon ir kt. 2005, Burgon ir Williams 2003, Motteram 2006). Tolesnėje dalyje pristatomi keli atlikti akademiniai tyrimai.

Mokytojų rengimo strategijų pavyzdžiai

Norvegijos švietimo įstatymas (UFD 1998) įtvirtino nuostatą, kad visų lygių moksleiviams turėtų būti prieinamas pritaikytas mokymasis. Bjarno (2005) aprašo, kaip nacionaliniai tyrimai rodo, jog mokytojai, ruošiantys moksleivius, nežino kaip integruoti IKT į discipliną kaip konstruktyvią priemonę. Ne IKT įgūdžiai reikalingi, bet visų pirma keletas gerų pavyzdžių, kaip naudoti IKT kaip integruotą skirtingų disciplinų dalį. Kai Švietimo ir mokslo ministerija Norvegijoje patvirtino naują Nacionalinio mokymo plano moksliniam laipsniui mokytojų rengime programą 2003 m. IT departamentas Oslo universitetinėje kolegijoje pažiūrėjo į tai kaip į galimybę reorganizuoti IKT mokymą ir mokytojų rengimo stebėjimą. Visas fakultetas palaikė šią iniciatyvą ir pradėjo planuoti projektą, kurio tikslas buvo išvystyti daugiadisciplininį mokymą, paremtą IKT, kuris sumažintų atotrūkį tarp praktikos mokytojų ruošime trūkumo ir pradinių bei vidurinių mokyklų poreikių. Norėdamas tai realizuoti, IT departamentas panaudojo mišraus mokymosi koncepciją mokymosi adaptacijai tvarkyti.

Bjarno (ten pat) tyrė mišraus mokymosi naudojimą moksleiviams ruošti integruojant IKT kaip priemonę, palaikančią mokymosi procesą, ir mokytojams ruošti, kad išnyktų spraga tarp mokytojų IKT žinių ir jų sugebėjimo pritaikyti IKT mokymosi procesui stiprinti. Ar galėtų IKT kaip paskaitų dalis kitose disciplinose būti būdas paruošti moksleivius jų darbui taip kaip mokytojus? IKT integravimas į visas disciplinas atrodo geras sprendimas šiam tikslui pasiekti. Moksleiviai turėjo IKT įgūdžių, bet jiems reikėjo pavyzdžių, kaip besimokančiuosius įtraukti į mokymą.

Todėl IKT departamentas pradėjo teikti pagalbą dėstytojams mokymo įstaigose integruojant IKT į įvairias jų disciplinas, vietoj susitelkimo ties atskirais IKT kursais. Įtraukus mokomąjį IKT naudojimą į mokymosi procesą, mokytojams, ruošiantiems moksleivius, buvo suteikta naudinga tolesnio mokymosi priemonė. Moksleiviai naudojo mokymo medžiagą keliais būdais, bet daugiausiai:

1. Kaip tinkle esančią medžiagą – online
2. Įprastos paskaitos (iki 350 moksleivių)
3. Stebėjimas, susijungus į kompiuterinius tinklus (iki 30 moksleivių)

Dėstytojai buvo priskirti prie pasirinktų temų ir buvo susieti su tinklu paremta mokymo medžiaga. Ji taip pat apėmė nuorodas į skirtingas terpes, tokias kaip video paaiškinimai, paveikslėliai, muzikiniai takeliai, stebimi per kompiuterių tinklus. Metodas reikalavo, kad kompiuteriniai tinklai turėtų tokią įrangą kaip video projektorius ir po vieną kompiuterį kiekvienam moksleiviui.

Rezultatai parodė nuolatinį mokomojo dialogo tarp IT departamento ir kitų dėstytojų poreikį, tam, kad būtų pasiekta sėkminga IKT integracija. IKT integracija į visas disciplinas pademonstravo, jog dėmesio centras pasitraukė nuo suplanuotų paskaitų prie naujomis edukacinėmis formomis paremto stebėjimo, kuris leidžia mokytojams kokybiškiau praleisti laiką su kiekvienu moksleiviu.

Vienas iš pagrindinių projekto įgyvendinimo universitete iššūkių buvo infrastruktūra. Reikėjo kiekvienoje klasėje įrengti naujus kompiuterius su instaliuota tokia pačia programine įranga, o taip pat moksleivių ir kompiuterių bei video projektorių skaičius klasėse turėjo padidėti. Projektas parodė, kad 21 % daugiau moksleivių, lyginant su praėjusių metų IKT integracija, atsakė, kad IKT pamokos ir stebėjimas buvo naudingi mokymosi procese. Pasak Bjarno, didžiausias iššūkis yra pereit nuo atskirų IKT kursų prie daugiadisciplininio mokymo, remiantis IKT plėtra.

Ne tik mokytojai, ruošiantys moksleivius, turi išmokti, kaip naudotis technologijomis mokymo procese. Voogt ir kiti (2004) taip pat teigia, kad mokytojams trūksta įgūdžių, leidžiančių integruoti technologijas į mokymo procesą. Technologijų potencialas klasėse sunkiai realizuojamas, todėl mokytojų mokymas, kaip klasėse panaudoti technologijas, laikomas labai svarbiu. Voogt ir kiti (ten pat) kreipia dėmesį į „mišrų“ rengimą, neatsitraukiant nuo pagrindinio darbo, kurio tikslas yra palaikyti vidurinių mokyklų mokytojus, integruojant technologijas į jų klases. Rengimas susideda iš seminarų, pavyzdinės mokymosi programos medžiagos ir kompiuteriais perduodamo bendravimo. Ši mišri mokytojų profesinio vystymosi prieiga parodė, kad tai perspektyvus būdas palaikyti technologijų integraciją į švietimą.

Mokytojų moksleivių ruošimo praktika gal būti viena iš svarbiausių švietimo dalių. Kitame pavyzdyje Motteram (2006) žiūri į mišraus mokymosi vaidmenį mokytojų rengime magistro studijų programoje Mančesterio universitete. Šio projekto rezultatai taip pat rodo, koks svarbus mišrus pobūdis moksleiviams, kad jie gautų subalansuotą programą įgūdžiams ir žinioms patobulinti, o taip pat tai leidžia jiems apvarstyti praeities ir ateities praktiką.

Kitame universitetiniame mokytojų rengimo kurse, skirtame būsimiems anglų kalbos mokytojams, besimokantieji turi mini praktiką, kuri įgyvendina mikro mokymą klasėse kaip mišraus mokymosi metodo dalį. Mokymosi koncepcija paremta mokymosi terpėje, sustiprinančioje mokymosi aplinką, kurioje veikla apima įrašus klasėje ir daugialype terpe paremtas atvejų istorijas bei elektroninius interviu su ekspertais, kurie buvo patyrę gramatikos mokyklos mokytojai, teorijomis. Praktika pasiūlė mokymo medžiagos analizavimo įžvalgas, praktinę pamokų planavimo praktiką ir mokytojo elgesio autentiškame mokymo kontekste patirtį.

Atvejų studijos naudojamos kaip mokomoji priemonė mokytojų rengime turėjo prisidėti prie artimesnio ryšio tarp teorinių ir

praktinių mokytojų švietimo aspektų. Daugialype terpe paremtos atvejų studijos buvo nuorodų sistemos, sukurtos kaip esminiai kompiuteriais paremto mokymosi modulių komponentai, kurie palaikė įvairius mokymosi būdus ir stilius. Moksleiviai dirbo su atvejų studijų medžiaga tiek vadovaujami, tiek savarankiškai keletą kartų kurso metu. Buvo nustatyta, kad yra trys besimokančiųjų tipai: moksleiviai, kurie daugiausiai patys kuria ir pritaiko patirtį, moksleiviai, kurie daugiausiai studijuoja teorinius šaltinius, ir moksleiviai, kurie kuria patirtį, susitelkdami į resursų atranką (Kupetz ir Ziegenmeyer 2005).

Kalbos mokymo strategijų pavyzdžiai

Kalbos mokymasis turėtų aktyviai nuteikti ne tik mokytojus, bet ir moksleivius tokiu būdu, kuris skatintų juos mokytis. Svarbu ne tik kalbos mokytojams išmokti mokyme taikyti technologijas, bet taip pat ir vaisingas moksleivių dalyvavimas kalbos kurse. Taigi tiek mokytojams, tiek moksleiviams reikalinga sistema, sukurta taip, kad stiprintų mokymąsi. Petra Neumeier (2005) žiūri į kalbos mokymosi kurso projektavimą, rašymą ir CALL paremtos medžiagos įgyvendinimą. Ji teigia, kad kursų projektuotojams reikia parametrų rėmų, kurie padeda apsispręsti dėl individualaus, susieto su kontekstu mišraus mokymosi įgyvendinimo. Geresniam faktorių, kurie formuoja mišraus mokymosi praktiką ir patirtį, suvokimui, pateikiami keli parametrai, formuojantys mišraus mokymosi aplinką. Pagrindiniai parametrai atsirado ir jiems įtaką padarė Jobline LMU tyrimai ir plėtros projektas Miuncheno universitete:

Individualių deskriptorių parametrai

1. Modelis • Susitelkimas į modelį	• Modelių paskirstymas • Modelių pasirinkimas
2. Integracijos modelis • Individualių modelių eilės nustatymas	• Integracijos lygis
3. Mokymosi turinio, uždavinių ir tikslų nustatymo paskirstymas	• Paralelinis arba izoliuotas
4. Kalbos mokymo metodai	• Mokymo metodų naudojimas kiekviename iš modelių
5. Mokymosi dalykų įtraukimas	• Sąveikos pavyzdžiai: individuali vs. (moksleivių, kuratorių ir mokytojų) bendra kalbos mokymosi veikla • Mokytojų ir moksleivių vaidmenų įvairovė • Autonomiškumo lygis
6. Vieta	• Klasė, namai, išorinė aplinka, kompiuterių klasė, instituciniai rėmai

Parametrai aprašo ir sukuria mišraus mokymosi aplinkos koncepciją kalbos mokymuisi ir mokymui (Neumeier 2005:167).

Autorė teigia, kad sėkmingai pritaikius parametrus, mišraus mokymosi idėja gali pasitarnauti kaip jungtis tarp gausių kalbos mokytojų, moksleivių, CALL ekspertų ir specialistų bendruomenių.

Kitas projektas, apimantis kalbos mokymąsi, buvo tinklu paremtos Anglijos akademinių tikslų (EAP) mokymosi programos britų moksleiviams, kilusiems iš etninių mažumų, pristatymas, parašytas Harker ir Koutsantoni (2005). Moksleiviai dalyvavo dviejuose skirtinguose mokymosi modeliuose 9 savaičių trukmės programoje – mišraus mokymosi ir nuotolinio mokymosi. Anot autorių, mišraus mokymosi modelis yra daug efektyvesnis moksleivių medžiagos išsaugojimui atmintyje, kai tuo tarpu pasiekimų lygis

buvo panašus abiejose grupėse. Suformuluota ir apibendrinta grįžtamoji moksleivių reakcija parodė, kad dauguma abiejų grupių moksleivių buvo patenkinti šia tinklu paremta EAP programa.

Sveikatos švietimo strategijų pavyzdžiai

Ellis ir kiti (2006) atliko išskirtinį moksleivių mokymosi patirties, tiek diskutuojant online, tiek kontaktiniu būdu, tyrimą. Studijų kontekstas buvo antrų metų socialinio darbo psichologijos kursas, kuriame mokytojas kūrė diskusijų užduotis, pradėdamas nuo kontaktinio mokymosi modelio ir tęsdamas internetinėmis diskusijomis. Norint ištirti kaip studentai suvokia, ką jie mokosi, kokie jų ketinimai ir jų požiūrį į mokymąsi diskusijų būdu, buvo panaudota atvirų klausimų anketų ir pusiau struktūrizuotų interviu kombinacija.

Interviu ir atvirų klausimų anketų analizės duomenys atskleidė daug kokybiškai skirtingų suvokimų, ketinimų ir požiūrių į mokymąsi diskusijų būdu. Buvo nustatytas ryšys tarp to, ką moksleiviai galvojo išmoksiantys diskusijų būdu, jų požiūrio į mokymąsi diskusijų būdu ir jų kurso įvertinimo. Autoriai teigia, kad moksleiviai, kurie nuosekliai suvokia, ko mokosi, ir pritaiko gilesnį požiūrį gauna geresnius kurso įvertinimus. Be to, rezultatai rodo, kad nėra jokio ryškaus skirtumo tarp gilaus ir paviršutinio požiūrio į kontaktines diskusijas ir kurso įvertinimo.

Davies ir kiti (2005) tyrė BS fizioterapijos studentų neurologinių stebėjimų ir analitinių įgūdžių vystymo patirtį, naudojant mišrią tradicinę klasės veiklą ir kompiuteriais paremtą medžiagą Birmingemo universitete. Nauji mokymo ir mokymosi resursai buvo sukurti ir palaikomi Medicinos mokslų mokykloje, naudojant kursų tinkle priemones, derinamas su didele pacientų su neurologiniais sutrikimais video įrašų kompaktiniuose diskuose įvairove. Šie resursai suteikia galimybę studentams stebėti „realius pacientus“ prieš įsidarbinimą klinikose, tokiu būdu panaikinant atotrūkį tarp jų teorinio sutrikimų suvokimo ir praktinės nenormalių judesių vertinimo patirties.

Kitą pavyzdį iš sveikatos sektoriaus pateikia Guldberg ir Pilkington (2006). Jie analizavo online diskusijų pavyzdį, skirtą įvertinti suaugusiųjų besimokančiųjų kaip specialistų vystymąsi tinklais sujungtoje mokymosi bendruomenėje. Jų analizė demonstruoja, kad moksleiviai priklauso uždarai praktinei bendruomenei, turinčiai įvairių pogrupių, pvz., šie moksleiviai yra tėvai arba globėjai žmonių, sergančių autizmo srities sutrikimais (ASD), taigi jie dirba kartu dalindamiesi ir bendrai formuodami supratimą apie tai. Bendri interesai ir supratimas, iš ko ir susideda gera praktika, padėjo sukurti saugią moksleivių bendravimo erdvę. Kai grupė nustatė savo tapatumą, iškilo nauji klausimai ir grupė galėjo apsibrėžti tolesnes bendras vertybes, supratimą ir tikslus nutarimų būdu.

Socialinių ir humanitarinių mokslų strategijų pavyzdžiai

Mokantis socialinių bei humanitarinių mokslų tenka atlikti daug užduočių, kurios reikalauja kurti tekstus. Tekstai dažniausiai yra užrašomi kompiuteriu. Per pastaruosius metus atsirado daug ir įvairių teksto formatavimo bei rengimo programų. Cox ir kiti (2004) įvertino sinchroninių interneto pokalbių svetainių edukacinį efektyvumą humanitarinių mokslų antrosios studijų pakopos kursuose ir prekybos paskutiniųjų metų kurse. Autoriai sako, kad mišraus kurso projektavimas, grupės dinamika ir online bendradarbiavimas kontaktiniuose kursuose palengvina daugiau apimančius mokymosi pokalbius, palyginus su tik kontaktiniu bendravimu.

Webb ir kiti (2005) siūlo mokymosi modelį, kurį puikiai palaiko technologijos ir kuris pagerina mokymosi rezultatus.

Autoriai pažiūrėjo į keturis semestro trukmės kursus, kurie buvo įvairios diskusijų klasėje ir online junginio formos. Tai buvo naudojama Informacinių sistemų valdymo (MIS) kurso mokyme. Rezultatai rodo, kad naudodami tinklo technologijas mokytojai gali pasiūlyti besimokantiesiems dalyvauti aukštos kokybės kursuose, naudojančiuose atvejų metodo pedagogiką internetinėje aplinkoje, galimybę. Be to, besimokantieji dirba ne tik taip pat gerai kaip tradicinėse klasėse, bet internetinėje aplinkoje gali pasirodyti geriau, o ypač jei taikomos mišrios tiek klasės, tiek „online“ technologijos. Atvejų metodo pedagogikos principai gali būti patobulinti sinchroninėmis bei asinchroninėmis diskusijomis. Tačiau autoriai teigia, kad mokytojai, ruošiantys internetinius kursus, gali pasijusti nuvertinti, kai tuo tarpu jei skiria kurso rengimui daugiau laiko nei tradicinėse klasėse.

Inžinerijos ir gamtos mokslų strategijų pavyzdžiai

Inžinerijos ir gamtos moksluose technologijų taikymas gali būti daug įprastesnis nei kitose disciplinose. Pagal Still Derntl ir Motschnig - Pitrik (2005), tyrimuose buvo skiriama mažai dėmesio technologijų integravimui, kad būtų patobulintas mokymosi procesas gilumo ir apimties prasme. Vieno akademinio tinklo inžinerijos kurso patirtis ir įvertinimas rodo, kad mišrus mokymasis prideda vertę tik kai jis yra vykdomas žmonių, turinčių aukšto lygio visuomeninius sugebėjimus, ir yra lydimas patikimų, lengvai naudojamų technologijų.

2002 m. pirmo kurso medicinos studentų rentgenologinės anatomijos mokymo būdas (20-30 studentų su dėstytoju) buvo pakeistas mišraus mokymosi modeliu, kuris apėmė trumpą mokomąjį pristatymą, po kurio sekė tinklu paremtas struktūrinis mokymasis mažose grupėse (7-8 studentai) su besikeičiančiais laboratorinių darbų vadovais. 2003 m. tokie moduliai buvo pakeisti, papildant juos savarankiškomis studijomis prieš pradedant laboratorinius darbus, tolesnius tyrimus ir du kartus per savaitę vykstančius neprivalomus peržiūrų užsiėmimus. Duomenys demonstruoja, kad kompiuterių kaip mokomosios priemonės integravimas mažose ar didelėse studentų grupėse yra gerai priimamas studentų ir skatina juos prisitaikyti prie teorijų. (Shaffer ir Small 2004).

Santrauka

Ši ataskaita parodo, kad yra keletas būdų integruoti mišrų mokymąsi į tradicinius universitetus. Mišrus mokymasis nėra naujas metodas aukštajame mokyme ir mokymesi. Nauja yra tai, kad galima rinktis junginio komponentus. Institucijos turi nuspręsti pagal pasirinktus kriterijus, kaip šie komponentai turėtų būti derinami, kad duotų vaisių. Mišrus kursas turi pastoviai išlaikyti balansą tarp kontaktinių studijų ir technologinių komponentų mokomuosiuose metoduose.

Mišrus mokymasis nėra tik mišrios įvairios terpės. Kuriant, vystant ir pristatant skirtingus junginių tipus – sudedamuosius, integruotuosius, bendruosius ar atviruosius – svarbiausia susitelkti į mokymosi rezultatus. Reikia įvertinti besimokančiųjų poreikius, mokymosi kultūrą, mokymosi resursus, elektroninę infrastruktūrą, pasiūlyto sprendimo pasiekiamumą ir palaikymą.

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