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EXTENSION OF EDUCATIONAL AWARENESS INTO HIGHER EDUCATION

Introduction to the special issue on higher education

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This collection of papers highlights the higher education conference held in Tallinn, Estonia in January 2013, sponsored by the European Social Fund via PRIMUS-programme. The conference drew together a 350-plus audience from all Nordic and Baltic countries plus educators from the UK, Ireland and Russia. Some keynote speakers and workshop leaders represented Estonian universities (Larissa Jõgi, Mari Karm and Kristjan Port), others were from overseas: James E. Groccia from Auburn University (USA), L. Dee Fink from University of Oklahoma (USA), Lynn McAlpine from University of Oxford (UK), Kathryn Sutherland from Victoria university of Wellington (New Zealand) and Susan M. Zvacek from Fort Hays State University (USA). Overseas lecturers were invited to share their varied experience while regional presenters discussed the steps needed to meet the stakeholders' expectations. Four subtopics extended ranging from strategies for teaching non-traditional, diverse students to applications of modern technology in teaching. Some speakers voiced their concerns about the reduced competitiveness of mass higher education. A lot of current higher education issues were left off the agenda, e.g. ranking, governance, financing, management, special education needs. A prominent local politician admitted the necessity to move away from the model of free higher education adopted as recently as in 2013 by Estonian public universities as it was not viable.

This collection of articles features scholarly work selected through peer review process to the conference. The studies represent both qualitative and quantitative approaches to issues in higher education.

An international team of authors discusses entrepreneurship education, covering a vast array of countries. As reflected by the EU documents published since 2001, European higher education seems to lack entrepreneurial spirit although the importance of entrepreneurship issue has extensively been addressed by policy documents in almost all societies of the world. (Higher) education institutions need to increase their efforts in encouraging entrepreneurship while maintaining the high quality of specialist training and promoting research-related knowledge and skills. The authors of these two papers represent teaching and research communities in three countries, some of them were originally drawn together during graduate spring school in Aarhus in 2012.

Liina Adov, Olev Must, Mari-Liis Mägi Karin Täht, and Gerli Silm from the University of Tartu, Estonia, focus on the results and motivation of students related to low-impact testing. Tests of this kind may be applied to assure a competitive or threshold-based admission to the studies, while the low-impact tests are widely used to collect fair and comprehensive feedback throughout the studies. Among the wide range of formative assessment tools in use in higher education, the impact of any individual assessment instruments remains low. This article represents a collaborative research model joining together senior academics, young researchers and PhD students.

There is a paper on intercultural issues by Kirsi Kettula and Maija Lampinen from Aalto University, Finland, Fei Fan and Dan Jiang from Tongji University, China. Universities in many parts of the world claim to have consolidated their experience in providing quality education for Asian and African students. Newcomers to international higher education market need to elaborate their approaches, which means modifying the national (traditional, conventional) teaching style, assessment technique and administrative provisions – beyond just mastering the English language. This article was prompted by specific challenges faced by the authors.

Laura Hirsto from University of Helsinki together with Maija Lampinen and Maire Syrjäkari from Aalto University, Finland, present a long-term study following a process-oriented university teacher-training course that sought to integrate students with different disciplinary backgrounds. The design of this full-year course was inspired by the idea of community of practice and collaborative inquiry learning.

Liina Lepp, Marvi Remmik, Mari Karm, and Äli Leijen from the University of Tartu, Estonia, have explored PhD supervisors' ideas of faculty requirements towards supervision of doctoral candidates. The study shows that the faculty supervising PhD dissertations across the disciplines agree that the main objective of doctoral study is that a PhD candidate has to become an independent researcher. Another issue highlighted by the study was the gap between the years required until graduation from science-based doctoral programs on the one hand, and humanities and social sciences on the other. The reasons include the availability of more laboratory-centred teamwork and better funding options in natural sciences, which will lead to timely graduation.

To sum up, may I assert that research in higher/tertiary education has grown exponentially including a wider range of topics, levels of education and applying a growing range of research methodologies since the 1970s. Some of the more recent topical additions include issues with student harassment, special needs, study motivation, fair access, and efficiency. Throughout this process of growth, in Estonia similarly to other countries who have welcomed a wider, non-traditional population to institutions of higher education, foci have obviously shifted, as there is more need than ever to provide additional support to educators in the classroom. These developments have been accompanied by the extension of education research into the higher education. In a tiny Estonia in charge of a distinct Finno-Ugric language with less than one million native speakers there are more than 30 higher educational institutions and around 70 000 students, while the expenditure per student remains quite low and this discrepancy causes a value conflict in academy (Jaakson and Reino 2013).

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THE SOURCES AND DYNAMICS OF EMOTIONS IN ENTREPRENEURSHIP EDUCATION LEARNING PROCESS

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Abstract. The study investigates student experiences of entrepreneurship education and focuses on gaining a better understanding of the main sources of emotions as well as the role and dynamics of emotions in learning. Data was collected in three entrepreneurship education settings in Estonia, Finland and Namibia using in-depth interviews (N = 79) and was analysed using qualitative thematic analysis. As a result, three themes highlighting the main sources of emotions were identified: 1) new kind of learning environment, 2) collaborative learning, and 3) challenging tasks. The learning environment sub-categories were: 1a) uncertainty and confusion, 1b) theory versus practice and 1c) support from outside. The collaborative learning sub-categories consist of: 2a) teamwork, 2b) time pressure and 2c) individual differences. Challenging tasks had the sub-categories: 3a) overcoming knowledge and skills gaps, 3b) interacting with the outside world and 3c) leadership and managing people. In addition, dynamic patterns of emotions in the course of learning processes were identified.

Keywords: emotions, entrepreneurship education, learning environment, collaborative teamwork, challenging tasks, dynamic pattern, thematic analysis

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1. Introduction

Emotions are always present in learning processes, and are triggered by a variety of elements such as personal and contextual factors, instructional strategies, prerequisite knowledge, learning goals, motivation, etc. Recent studies within the field of education, entrepreneurship education and beyond imply that emotions have a major impact on learning motivation, self-regulation and identity building (Cope 2003, 2005, Efklides and Petkaki 2005, Efklides and Volet, 2005,

Gibb 2002, 2010, Heron 1992, Kyrö 2005, 2008, Mezirow 1991, 2003, 2006, Pekrun 2005, Pekrun et al. 2007, Pintrich 2004, Pintrich and Zusho 2007, Pittaway and Cope 2007, Pittaway and Thorpe 2012, and others). Many of these studies indicate that even though student emotions develop in the social context, it is still unclear how such a process can be supported so that it enhances student learning, and how negative emotions could be put to productive use (Efklides and Volet 2005, Pekrun 2005). Furthermore, Pekrun (2006) states that many studies focus on a single emotion or single functions of emotions, leading to fragmentation and a lack of a more integrative approach. Kyrö (2008) calls for more research on affective constructs in education due to their potential to empower entrepreneurial learning. Similarly, Cope (2003) underlines the need for more research on the social dimension of the learning process and its relation to emotional intensity, as this has an impact on reflection and learning.

Following the line of thought presented above, the aim of this paper is to gain a better understanding of the role and dynamics of emotions in entrepreneurship education learning processes and of the most important sources that are causing these emotions, both negative and positive.

2. Emotions in education and entrepreneurship education

The role of emotions in student learning has recently emerged as an important new field of educational research. Studies have addressed questions such as what emotions are experienced by students, what functional importance these emotions have for learning, and whether modified instruction and teacher behaviour can foster student emotions (Pekrun, 2005). For example, Järvenoja and Järvelä (2005) identified five different sources of emotion: *self-related, context-related, task-related, performance-related* and *social-driven*. Pekrun (2006) and Pekrun et al (2007) introduced the control-value theory of achievement emotions, according to which emotions are directly tied to achievement *activities* and achievement *outcomes.* Thus, as they point out, this can be reflected in the enjoyment arising from learning when goals are successfully met or anger about task demands or other pressures. According to Pekrun (2006), *activity emotions* are associated with on-going achievement-related activities, and *outcome emotions* are related to the outcomes of these activities. Depending on circumstances, these emotions can be positive or negative, and activate or deactivate learners. Since emotions affect student interest, engagement, achievement, personality development and social climate in different educational settings, they are central to psychological health and well-being (Pekrun 2006). Most importantly, emotions influence student academic performance and are linked to motivation, use of learning strategies and self-regulation (Pekrun et al. 2007).

In line with Pekrun's theory, Pintrich and Zusho (2007) also claim that motivation and self-regulation both play an important role in learning and achievement for college students. Pintrich and Zusho (2007) offer three com-

ponents that seem to have been widely used in different motivational models: 1) beliefs about one's ability or skill to perform a task (expectancy components), 2) beliefs about the importance and value of the task (value components), and 3) feelings about the self, or emotional reactions to the task (affective components). All these components are also present in the control-value theory (see Pekrun 2006, Pekrun et al. 2007).

Sansone and Thoman (2005) suggest that dynamic patters of positive and negative emotions occurring over time lead to either good or bad learning processes. They add that these qualitatively different patterns of emotional experiences at various stages of engagement may also lead to distinct learning outcomes. Furthermore, they state that there is a need to develop new methodologies for uncovering the important dynamics in learning over time (Sansone and Thoman 2005). D'Mello et al (2005) complement this by claiming that confusion that is triggered by contradictions, conflicts, anomalies, and other factors can even be beneficial in learning if regulated appropriately. Therefore, it is important to understand the role and dynamics of emotions in different kinds of learning contexts and use this knowledge wisely in pedagogical practices.

Within entrepreneurship education only a few researchers have explored the emotional aspects of teaching and learning. Some have highlighted that this is an important area where further research is needed (Kyrö 2008, Gibb 2005), but very few have studied it explicitly. Cope (2003, 2005, 2010) has prioritised emotions within entrepreneurial learning, but his research has mainly focused on informal learning environments. A notable and potentially valuable exception has been Pittaway and Cope (2007), focusing on how to simulate entrepreneurial learning in an educational setting based on action and experiential learning theories. Their empirical data showed that emotional exposure created through group dynamics played a major role in effective student learning. Even more, in entrepreneurship education there is a preference for creating real-life time pressured learning environments with unexpected events (Cope 2003, Gibb 2008, Pittaway and Cope 2007). This means learning where the learners have to take responsibility of their own learning, to control their achievement as an individual learner and as a member of a social learning environment. Experiential learning typically involves various challenges, problem solving situations and dilemmas that generate high levels of emotion, which can have an important impact on learning and identity-building processes. All this places learners under extreme levels of emotional pressure and 'personal exposure' associated with running a small business (Cope 2003), and brings the emotional content of the learning – what it really feels like – as the focus (Cope 2003, Gibb 2010, Pittaway and Cope 2007).

Experiential learning theories that have distinct humanist connections and emerge from the field of adult education (e.g. Heron 1992, Kolb 1984, Mezirow 1991, and others) are often used as the basis for entrepreneurship education. In educational research, similar theoretical principles are presented by social-constructivist theories of learning (e.g. Gergen 1994, Tynjälä 1999) and their applications, such as the Model of Integrative Pedagogy (see Tynjälä, 2008;

Tynjälä and Gijbels, 2012, and Täks et al. 2013). Even though the abovementioned theories use different theoretical concepts, their pedagogical implications can be very similar. For example, both focus on metacognitive and self-regulative skill development, constant and creative problem solving, collaborative social learning, interaction with the real world, the integration of theoretical and practical knowledge, critical thinking, and constant reflection in the learning environments where the teacher is the facilitator of student learning.

3. Purpose of the study

Cope (2003), Pittaway and Cope (2007) and Gibb (2008) emphasise that learning environments based on experiential and socio-constructivist theories create real-life, time pressured and unexpected flows of events that place students under high levels of emotional pressure as well as personal exposure. However, the role of emotions in these contexts is seldom examined. Therefore, the purpose of the present study was to examine the role and dynamics of emotions in entrepreneurship education. In more detail, the following research questions were addressed:

- What are the main sources of negative and positive emotions in entrepreneurship education learning process?
- What kinds of dynamic patterns can be identified?

4. Method

4.1. Context, sample and procedures

The data for the study were collected from the students in entrepreneurship interventions in three countries – Estonia, Finland and Namibia. These are small societies in different phases of their economic development: one matured economy, one transitional economy and one developing economy. *The Estonian data* (N = 48) were collected from a socio-constructivist learning setting, an entrepreneurship course for engineering students from the TTK University of Applied Sciences that lasted four months. The students were fourth year full-time engineering students from three different disciplines: two Automotive Engineering student groups, one Resource Management in the Field of Clothing and Textiles and one Technical Design and Technology of Apparel group. The entrepreneurship course followed the principles of integrative pedagogy (Tynjälä 2008, Tynjälä and Gijbels 2012, Täks et al submitted) and was mandatory for all participants. The aim of the course was to simulate real-life activities, based on project-based, interactive and collaborative learning, and to focus on integrating theory and practice. A basic principle in the pedagogical design was learning by doing. The data were gathered in two parts; videotaped semi-structured group-interviews (N = 48) right after the course, and in-depth individual interviews with selected students from the same

group (N = 16) approximately two months after the course. All the data were audio-recorded and transcribed verbatim.

In Finland and in Namibia, the data were gathered in two experiential learning settings: Proacademy and Prolearning, in universities of Applied Sciences in Tampere, Finland and Windhoek, Namibia. The *Finnish* students had been studying for a 3.5 year programme for a Bachelor degree, where the last two and half years were spent at the Proacademy. Instead of lectures and exams, the learning process was supported by coaches, and the process included the latest professional books, tools and theories relating to organisational and situated learning. The students set up a team company and integrated their learning needs to support the development of the team and sustainable company. In Namibia, the learning model used similar experiential learning principles, as the Namibian Prolearning programme is based on the model of the Finnish Proacademy described above. The *Namibian* students were mainly from a business administration programme studying for a five-year honours degree, where the last two years are spent in the Prolearning programme.

The *Finnish* data (N = 18) were gathered during 2.5 years of Proacademy studies. The students were interviewed three times using individual semi-structured interview schemes: at the beginning, in the middle and at the end of the programme. The interviews were audio-recorded and transcribed verbatim. The *Namibian* data (N = 13) were gathered and organised similarly to the Finnish research, but in addition, a fourth interview was held approximately one year after the studies with ten students (N = 10). Both in Finland and in Namibia the students applied for the entrepreneurship programme and were selected based on individual interviews.

The interview questions used in the present study were similar in the three study contexts and included, for example, the following themes:

- Comparison of the subject with other courses
- Discussion of the issues that were handled during the courses
- Discussion of the students' role as a learner during the courses
- Discussion about the motivation, relations and emotions about the entrepreneurship and entrepreneurial learning, and
- Expectations and reservations of the learner to this kind of learning

4.2. Data analysis

As mentioned earlier, the purpose of the study was to identify sources and dynamics of emotions in entrepreneurship education. We were especially interested in features that would be common to different contexts, different disciplines and different countries and therefore the data gathered in the three countries was treated as one database. To identify similarities, a thematic analysis (Ryan and Bernard 2003, Braun and Clarke 2006) was applied with the aim of identifying and illustrating sources of emotions, as well as the role and dynamics of emotions throughout the learning process. Braun and Clarke (2006) state that the rationale for choosing this methodological approach makes it possible to

provide rich and detailed qualitative data that can be used within different theoretical frameworks. To identify the underlying ideas and assumptions that involved the interpretation of data, the six-phase model of thematic analysis by Braun and Clarke (2006) was applied as follows: 1) getting familiar with the data, 2) generating initial codes, 3) searching for mutual themes, 4) reviewing found themes with related sub-themes, 5) defining and naming the themes, 6) producing the results. This was achieved by iteratively moving back and forth between the coded data set and discussing the findings at different phases of the analysis with all the researchers involved in the process.

During the data analysis and discussions among the researchers, the dynamic patterns of emotions started to emerge. For a more systematic analysis, firstly positive and negative emotions of each theme and sub-theme were identified and compared. Secondly, these identified expressions of emotions were iteratively located and relocated in different situations in the entrepreneurial courses until the main dynamic pattern from negative toward positive emotions throughout the learning process was identified. Finally, as a result of this systematic iterative analysis, the expressions of emotions were divided into three main sections that also highlight the dynamics of the emotions in different phases of the learning process.

5. Results

5.1. Sources of emotions

Data analysis indicates that the most frequent sources of emotions can be divided into the following themes:

1) new kind of learning environment
    - 1a) uncertainty and confusion
    - 1b) theory versus practice
    - 1c) support from outside
2) collaborative learning
    - 2a) team work
    - 2b) time pressure
    - 2c) individual differences between the learners
3) challenging tasks
    - 3a) overcoming knowledge and skills gaps
    - 3b) interacting with the real world
    - 3c) leadership and managing people

5.1.1. A new kind of learning environment

The first powerful source of emotions emerging from the data was the transition from a traditional learning environment to an activated learning environment based on socio-constructivist thinking and the Model of Integrative Pedagogy (in

Estonia) or experiential learning theory (in Finland and Namibia). The theme a *new kind of learning environment* was divided into three sub-themes: 1a) uncertainty and confusion related emotions, 1b) theory vs. practice related emotions, and 1c) emotions related to support from outside. Example quotes of these themes are exhibited in Table 1.

Table 1. Emotions related to the transition from traditional to activated learning environment

Main theme	Sub-themes	Quotes from the data
1. New kind of learning environment	1a. Uncertainty and confusion	"We have had so many subjects where we just sit, write and listen… but now we had to look and think everything by ourselves; independently" (Estonian, male) "I feel good about it. A little bit scared at the same time because I know it will be challenging but also feel good about it because I want to try something new..." (Namibian, female) "… okay, we are used to being told what you should do and what you should not do. Now you have to learn on your own. And it's very challenging…" (Namibian, female)
	1b. Theory vs. practice	"I feel relieved because you can really see that even when I do my own reading I got enough time to contextualize what I'm reading. I got enough time to apply what I'm reading. Because what I can read yesterday, I can really apply today. Unlike in the old tradition what I can read today, I only apply it after I graduated. So to me, the feeling is really of a professional. Of somebody who is trying to be an expert in the field." (Namibian, male) "I am wondering if I can really learn enough theory here, as during my last year studies we had a lot of theory. Do I actually learn here? ... but I have thought that you really learn by doing… still, I am still thinking if there will be some theoretical things, which I don't learn here?" (Finnish, female)
	1c. Support from outside	"The fact that people did not actually believe in the course, especially from the management side and from other lecturers …so it was a bit difficult for doing the course that people did not really have a lot of faith in." (Namibian, male) "They train mechanics here … subordinate … entrepreneurship is rather discouraged in this school." (Estonian, male)

Since the emphasis was on learning by doing in all three learning settings, the students had to take responsibility for their own learning. They had to face new situations, cope with uncertainty, solve problems, find a balance between theory and practice and seek relevant information by themselves. This caused confusion and stress, especially at the beginning of their studies. Support from 'outside' the programmes, from the management and co-lecturers as well as from fellow students, was reflected by the students as a very important factor of learning motivation.

The transformation from a traditional learning environment to an active, collaborative learning environment raised questions among the students about learning goals, uncertainty about the theoretical grounding of the learning as well

as self-regulation issues. Students in all three learning environments studies experienced the change in the learning environment as transformative, which caused strong negative emotions (worry, stress, frustration, annoyance, and anxiety) and a sense of uncertainty. The variation in learning experiences helped learners to realise and see different angles, as well as recognise the advantages of this kind of learning. Table 1 presents examples of student experiences of situations where a *new kind of learning environment* was a source of emotions.

5.1.2. Collaborative learning

The second powerful source of emotions was related to the *collaborative learning* and team work environment that could be divided into three sub-themes: 2a) team-work related emotions, 2b) time-related emotions, and 2c) emotions related to individual differences. Some examples of these sources of emotions are exhibited in Table 2.

Table 2. Emotions related to collaborative team work

Main theme	Sub-themes	Quotes from the data
2. Collaborative team work environment	2a. Team work	"If we can make it as a team through this challenge we can make it through the next." (Namibian, female) "... teamwork is very important, and right now even with the job that I'm doing, we have a team, it came like an easy thing, because I'm already used to working in a team. So I think one of the most valuable things that I've learned is teamwork." (Namibian, female)
	2b. Time management	"The most difficult was to find the time ... it was really challenging, but once we got together, we managed to work well." (Estonian, female) "To tolerate the stress and the matter that you have to work a lot with high speed… and also then you understand that if you leave some things undone, it will also harm the other team members... you learn to think also about the others and not just about yourself." (Finnish, female) "… /../ We work, we are like talking, we are there, and everybody has their different ideas, their different view on certain things. So we'll sit there for hours just discussing one thing and then we don't come to a conclusion-" (Namibian, Female)
	2c. Individual differences	"… when you have to work with different people … everybody has their background, vision … it makes it difficult to fit everything and make people move in the same directions…" (Estonian, male). "/../the most difficult in this group/../ Even though I knew the people it's like okay we're never this close. And it's like sometimes is like the personality clashes and all those different opinions and those who do not reconcile with your opinion And then it's like you don't know how someone else is going to feel when you say something or when you oppose … " (Namibian, male) "It has not been easy to try to forget my own ideas and be more objective to understand the views of my team mates and not just stick in my own ideas..." (Finnish, male)

Even though being the source of emotions, both positive and negative, the team work experience was considered necessary and useful. Team pressure and team support helped to overcome the stages of learning where frustration and negative emotions dominated. Time management was considered challenging and came up during the interviews quite often. The constant lack of time was considered stressful, but also helpful to keep students up with the study-related tasks. At the beginning of their entrepreneurship studies many of the students in all countries felt insecure and puzzled trying to find their own place within the team. Adjusting to the new team members with different socio-cultural backgrounds, previous knowledge and learning conceptions was considered challenging as well as fascinating, involving both negative and positive emotions. However, during the studies the students noticed the strength of the team and the opportunity to learn a lot from each other. They started to value team skills as important skills for future work life, i.e. dealing with different kinds of people.

5.1.3. Challenging tasks

The third source of emotions related to challenging tasks and could be divided into three sub-themes: 3a) overcoming knowledge and skills gaps, 3b) interacting with the outside world, and 3c) leadership and people management (Table 3). Financial calculations, sales prognosis, leadership and budgetary issues were found to be the most challenging tasks, especially in cases where the learners lacked previous knowledge and experience.

A supportive team environment was recognised as being a great source of motivation and helped to deal with difficult tasks. Also, interaction with the real world was considered challenging: in the Estonian case students were hesitant about talking with potential customers. In Namibia and Finland, the teams were doing business with real customers with real budgets, and these interactions caused a lot of positive and negative emotions. Leadership issues were considered both difficult and rewarding, complicated when conflicts appeared, and positive when the team performed well. Consequently, all the challenges mentioned were experienced as difficult and even frustrating at times, but after successfully completing challenging assignments, the participants recognised having learned a lot and found their studies valuable and fulfilling.

In general, the aspects of learning that caused a variety of emotions seemed to result in better self-awareness and self-confidence, and therefore, possibly improved the self-regulative abilities of those participating in the study. In addition, data suggest that all students consequently experienced an improved ability to cope with uncertainty, especially in the case of Finland and Namibia (due to the extent and nature of the programme).

Table 3. Emotions related to challenging tasks

Main theme	Sub-themes	Quotes from the data
3. Challenging tasks	3a. Overcoming knowledge and skill gaps	"Well, this financial part of the business plan was the time when we had disagreements within the group. I think we just didn't know how to do it /…/ but on the other hand, this gave us motivation to continue and resolve the exercises, and in general we had a very motivating atmosphere in the group, none one of us was ready to give up." (Estonian, female) "... I did like doing the presentations, but to go through all the material, to prepare it, was challenging and presenting the way that others understood it …" (Estonian, male) "Those challenges that were completed successfully made us all extremely happy and relieved." (Namibian, female) "I think the most of the positive emotions came from when we succeeded with the project." (Namibian, female)
	3b. Interacting with the real world	"… to conquer your own fears, as here you need to be kind of very active yourself. You have to call people you don't know, make contacts, sell your own products… so at the beginning it is quite scary, as earlier you did not need to do that at all." (Finnish, male) "It's the point of these projects, as there we have real customers and you need to do a good job for these customers, no matter how tired you and the others are, but you have to do your best and that's of course stressful…" (Finnish, male)
	3c. Leadership and managing people	"….occupying the position of business leader /…/ and these thirteen individuals come to you with personal problems, problems they have with their team members. And then you have to sit and look at both sides of the story/…/ all the friendships are there, but we have to be professional at the same time." (Namibian, male) "You have to be the leader to drive the company forward… because the vision comes from you /../ but organising team work and delegating and dealing with people makes it complicated /../ challenging and fascinating /../ you have to motivate your team /../ even those who were scared or hesitant at the beginning." (Estonia, male). "I learned how to manage the team, to be a leader. I had to find different methods and use techniques to motivate the team members to work for our vision. Not everybody is able to motivate themselves, and sometimes you had to be strict and concrete as well…" (Estonia, male)

5.2. Dynamic patterns of emotions in entrepreneurship education

The data from three different countries and learning settings showed that emotions not only played an important role in entrepreneurship education, but that they also followed certain identifiable patterns in the course of the learning process. We call these patterns 'waves of emotions' and they are presented in Figure 1. The figure is divided into three main sections: 1) emotions that dominated at the beginning of the learning process, 2) emotions that appeared important throughout the learning process, and 3) post-learning emotions. As can be seen in Figure 1, the three main sources of emotions (learning environment,

Figure 1. The waves of emotions.

collaborative learning and challenging tasks) with their sub-sources are strongly interrelated with each other during the learning. In addition, it is evident that the meaning and role of emotions changed when the collaborative team work improved in the learning process. In general, a collaborative team work environment seemed to be central in coping with either confusion reflected in theme 1 (learning environment) or challenging tasks reflected in theme 3, indicating that team work is a crucial source of support during this kind of learning experience. In addition, transformation of learning environment (theme 1) causes a lot of emotions, especially at the beginning of the studies (mainly negative) and after the end of studies (positive). The data also indicated that positive emotions, constant reflection, dialogue and feedback on the achieved outcomes during the learning helped students to overcome the difficulties that were experienced. Time management seemed to play a key role throughout the studies, being an important but challenging factor related to success in team work and the achievement of the learning goals.

The straight yellow line in Figure 1 illustrates students' increased ability to cope with uncertainties throughout the learning processes in different themes. The figure also illustrates the intensity of emotions during different phases of the learning process and related to different themes. For example, the negative emotions were strongest when related to interacting with real world and to individual differences, whereas positive emotions were strongest in situations where knowledge and skills gaps were overcome and especially at the end of the course when the students could see the benefits of the new kind of learning environment as a whole. It has to be kept in mind, however, that the intensity illustrations here are only suggestive and are not based on objective measures.

6. Discussion

The current study focused on gaining a better understanding of the most important sources of positive and negative emotions, and the role and dynamics of emotions in entrepreneurship education learning process. The findings were derived from individual interviews from three different educational settings – Estonia, Finland and Namibia. As a result, three main themes of sources of emotions were identified as follows: 1) learning environment, 2) collaborative learning, and 3) challenging tasks.

When comparing our study results with earlier findings by Järvenoja and Järvelä (2005), similarities and differences in the identified sources of emotion can be seen. While their study resulted in 5 sources of emotions, that is, self-, content-, task-, and performance-related and socially driven, in our study these sources were included in the sub-themes. For example, sub-theme 1a, uncertainty and confusion, is a self-related source of emotion, sub-theme 1b, theory versus practice, is a content-related source, and sub-theme 1c, support from outside, is a socially driven source. Therefore, these sub-themes describe the sources of emotions in a

more detailed way. On the other hand, of our three main themes, only one, challenging tasks, relates directly to Järvenoja and Järvelä's sources of emotions. The two other themes in our study, a *new kind of learning environment*, and *collaborative learning*, refer to the context of learning and the process of learning, respectively. Consequently, these main themes describe sources of emotions at a more general level. The differences in the sources of emotions may be related to the level of education and the nature of the learning environments.

In addition to these results, the data highlight that both positive and negative emotions play an important and beneficial role in learning as long as there is a balance between positive and negative emotions. This supports earlier findings by Pintrich (2004) and Pintrich and Zusho (2007) stating that motivation and self-regulation, which exist in close interplay with emotions, play a significant role in learning. Pekrun (2006) and Pekrun et al. (2007) highlight that activity and outcome emotions are closely related, and these relations could also be seen in our results.

Our findings have important pedagogical implications. As to the first main source of emotions, a new kind of learning environment (theme 1), sharing the feelings and knowledge, having constant dialogue, reflection and feedback within the team from the peers and the coach/teacher proved to be effective coping strategies to overcome negative emotions, as well as the challenging tasks in the learning process. In addition, management support or the lack of it seemed to play an important role. Therefore, it is essential to consider these issues when adapting this kind of learning setting into school programmes.

The other important source of emotions, collaborative learning (theme 2), seemed to play a central role in learning, and that should be taken into account in planning similar kinds of learning settings. If emotional aspects are neglected and problems in teams remain unsettled, it could possibly lead to an overload of negative emotions and bad learning experiences (D'Mello et al 2005, Sansone and Thoman 2005).

Being aware of how learning can be supported, as well as when and what kind of support is needed helps the learners to overcome even the most challenging tasks (theme 3) and can turn negative emotions into positive learning outcomes. Consequently, understanding what could be done to engage, activate and enhance positive emotions in order to support motivation, self-regulation and deep learning is crucial (Perkun 2006, Pintrich 2004, Pintrich and Zusho 2007) in these kinds of learning environments.

In addition to the sources of emotions, the study identified the hypothetical pattern of emotions, 'Waves of emotions' which help us understand w*hat* kinds of emotions emerge and *why* these emotions appear during entrepreneurship education learning processes.

These dynamic patterns with positive and negative emotions in entrepreneurship education suggest how to regulate the learning process so that confusion, contradiction and conflicts could be directed toward positive outcomes. The patterns also raise the notion of what could be done in order to help a learner believe in his or her

ability to perform a task, and to see the value of tasks that lead to positive feelings about themselves. The learning environment should be organised so that it encourages students to experience different emotions, and even to fail occasionally, but to see those failures as learning opportunities. Therefore, the hypothetical pattern of 'waves of emotions' in learning environments with real-life authentic content contribute to designing learning experiences that prepare students to cope with the turbulent business environments and uncertainties of their future work as entrepreneurs or intrapreneurs. In addition, these findings contribute to a better understanding of the complexity and dynamics of emotional patterns in entrepreneurship education learning process, offering ideas to assist in planning instructional strategies. It should be noted that these implications are not limited to entrepreneurship education, but can be applied in various domains of education when real-life and authentic content is integrated into a learning environment. However, these emotional patterns should be researched and analysed further in individual level.

Finally, the results support and provide deeper insight into the relationship proposed by Cope (2003) between the 'emotional intensity' of the event and the associated depth of personal reflection and learning' (p.446). An implication from this study that is perhaps counter-intuitive is that educators should regard negative emotions as an important and valuable trigger to deep learning, provided that they monitor and support the process carefully in order to avoid any detrimental effects on motivation and learning. In this study, both negative and positive emotions played an important role in learning. In line with the saying 'no pain, no gain' it has even been proposed that negative emotions should be regarded as a valuable aspect of education (Kyrö et al. 2011). Therefore, we suggest that teachers and students should be made aware that different emotions are involved in the learning processes, and that in situations where negative emotions emerge, appropriate actions may turn them into sources of better self-awareness and self-regulation, which in turn may lead to deeper learning. Therefore, the main implication of our findings is that emotions should be taken into account when designing learning environments and discussed in learning situations using different tools for reflection.

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LEARNING OUTCOMES OF UNIVERSITY LECTURERS FROM A PROCESS-ORIENTED UNIVERSITY PEDAGOGICAL COURSE

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Abstract. Learning outcomes from a one-year long collaborative inquiry-oriented pedagogical training course for university lecturers were investigated in this study. The course was a long-term, process-oriented university pedagogical course with students from different disciplinary backgrounds, and it was based on the idea of a community of practice and collaborative inquiry learning. The focus of the course was designing learning environment, process facilitation and supporting structures, but the content was not determined in advance; instead, the students produced the content based on their experiences, shortfalls in their current teaching competence and knowledge, and also the educational development needs of their working environment. The follow-up data were collected through questionnaires with open-ended questions on different phases of the course; group electronic learning logs were used as complementary data. According to the results, the long-term collaborative inquiry-oriented pedagogical training achieved pre-defined learning outcomes even though the actual content of the course was not pre-determined, and even went beyond them, especially in terms of empowerment.

Keywords: university teacher education, collaborative inquiry, process-oriented course, university pedagogy

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1. Introduction

Global trends such as educating a growing number of students, increasingly multicultural and heterogeneous student groups, the need to lengthen working careers as well as to increase the pace at which academic studies are completed, have imposed new challenges for universities and their teachers. This has increased the importance of educational or pedagogical training for university lecturers and professors in recent years. Boyer (1990) suggested that university professors, and especially university institutions, should reconsider and widen

their conception of academic scholarship. By paying more attention to the scholarship of teaching more emphasis would be given to the enhancement of the quality of teaching (Boyer 1990). One important means of developing the quality of teaching within the scholarship of teaching framework would be the idea of academics from different fields also conducting research into teaching and learning. While suggesting a more comprehensive model of the scholarship of teaching, Kreber and Cranton (2000) also considered the use of teaching and learning research important in the development of university teaching.

The OECD has recently completed a wide analysis of the pedagogical and professional development of primary and secondary school teachers (Scheerens 2010), according to which teachers feel that the most effective types of development are programmes leading to a qualification and research activities. Furthermore, according to Scheerens (2010), professional development activities that take place at regular intervals and involve teachers in a somewhat stable social and collaborative context (networks or mentoring) have a significantly stronger association with teaching practices than regular workshops and courses. These results from the school context, where teachers are often professionally qualified, cannot be directly applied to the university context, where teachers are usually researchers or academics with little or no pedagogical education.

University teachers are, nevertheless, professionals in their field of research, and they have their own experience of what it means to study and teach at a university. Therefore, we may approach their learning through professional development or the perspective of learning. There are different kinds of conceptualisations for professional development. According to an OECD report, effective professional development can be seen as an on-going process which includes training, practice and feedback and adequate time and follow-up support (OECD 2009). However, Loughran et al (2011) highlight the distinction between professional development (PD) and professional learning (PL). They argue that what we should be discussing is professional learning rather than professional development, as professional learning is about long-term collaboration with teachers to help them to develop their skills, knowledge and abilities in ways that are responsive to their pedagogical needs, issues and concerns. According to them, professional development practices are often short one-day sessions in which things are shown to teachers so that they can later apply them directly in their practice.

In the field of educational development, many different concepts have either been used interchangeably or in order to focus on different aspects of development; such concepts include, for example, faculty development, professional development, academic development, curriculum development and organizational development. In this article, the aim is to investigate a learning context which has both organizational or faculty development and personal or professional development aims. The aim of the course studied here was to go beyond the instructional or professional development of university teachers, utilize the approaches of professional learning (PL), and attempt to facilitate participants' efforts to develop their own department's teaching or curriculum. Thus, the idea was to work with

the university teachers to help them to develop their skills, knowledge and abilities in ways that were responsive to their needs, issues and concerns.

The organisational context of the course was a recently merged Finnish university with a centrally located teaching development unit providing pedagogical training for its teaching staff. The whole pedagogical training program included 60 ECTS credits (European Credit Transfer and Accumulation System), and it was divided into two parts (See Figure 1). As one ECTS credit equals approximately 27 hours of student work, 60 credits equals approximately one full year of studies. The main goal in the first part (25 ECTS credits) was to support the participants in the development of their teacher identity, and teaching skills. The main goal in the second part (35 ECTS credits) was to support the participants' role as educational developers in their own work communities and their ability to operate as active members in multidisciplinary research groups. Before they were able to proceed to the application process for the course, they needed to have completed at least 20 ECTS credits of pedagogical studies. The pilot course was called "Teacher as educational developer", and it was designed to be the core course of the Pedagogical training in Aalto University II.

During the 21st century, inquiry-oriented teaching has been given more emphasis in teacher education; however, despite robust scholarship at the conceptual level, there is a lack of studies investigating the results of inquiry-based teacher education (Schulz 2010). Consequently, this study investigated the learning processes and outcomes of university teachers in a phenomenon-centred inquiry environment and reflected on the collaborative inquiry process as an approach in university pedagogical studies. The specific context of this study was a long-term, process-oriented university pedagogical course developed at Aalto University in Finland. The students on the course came from different disciplinary backgrounds.

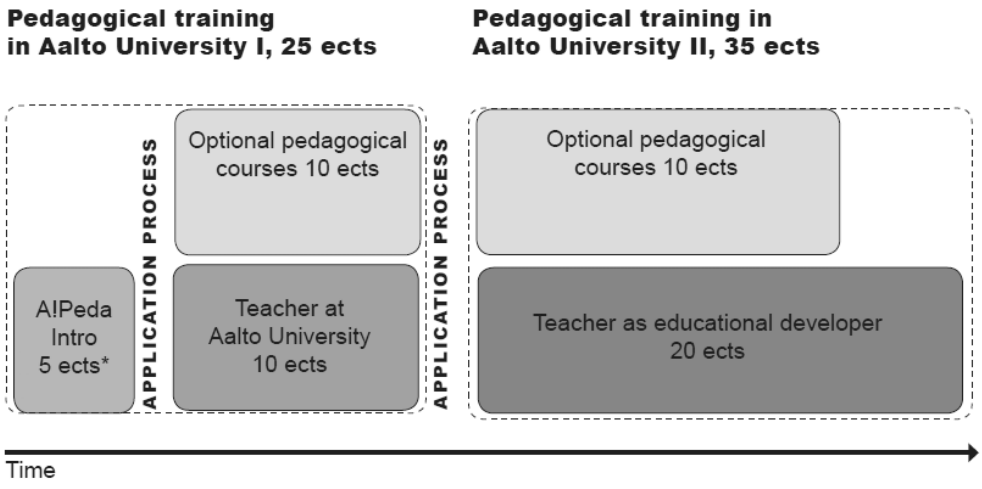

Figure 1. The structure of the 60 credit pedagogical training.

2. Theoretical viewpoints

The design of the course was based on the idea of a community of practice (Wenger 1998) and collaborative inquiry-learning (e.g. Heron 1996, Reason 2002, Sahlberg 2000, Hakkarainen, Lonka, and Lipponen 2004, Lakkala 2010, Muukkonen-van der Meer 2011). Decuyper, Dochy, and Van den Bossche's (2010) idea of team learning seems to include aspects from both communities of practice and collaborative inquiry-learning. They suggest that sharing, co-construction, constructive conflict, team reflexivity, team activity, boundary crossing, storage and retrieval are essential and interrelated in team learning. The progressive inquiry model (e.g. Hakkarainen, Lonka and Lipponen 2004, Lakkala 2010, Muukkonen-van der Meer 2011) and, especially, the idea of trialogical learning (Paavola and Hakkarainen 2005) stress that students' work on shared artefacts is important for knowledge creation. The main foci in the design of the course were the facilitation of shared artefacts, process facilitation and the provision of supportive structures.

One guideline for the course design was Wenger's (1998) idea that we cannot design learning, but we can design for it. The actual content, knowledge or concepts to be covered during the course were not determined. However, certain general issues that were related to the facilitative learning environment and a few general skills important to teacher development were determined. The aim of the course was to approach teaching as the creation of environments that support learners' efforts to construct meanings (Putnam 1996), thereby encouraging the participants to start to produce content for the course based on their needs, personal experiences and perspectives as teachers (Gross and Gilbert 2011), their current teaching competence and knowledge and, also, the educational development needs of their working environment.

According to Borko, Peressini, Romagnano, Knuth, Willis-Yorker, Wooley, Hovermill and Masarik (2000), it is the experiences on university courses and actual contextual teaching settings that are crucial for preparing teachers to adopt new methods. Furthermore, the compatibility of these settings is essential if they are to be mutually reinforcing and thus able to work in conjunction (Borko et al. 2000), Cochran-Smith (2001a, 2001b) also argues that we should eschew narrow definitions of learning where teaching is in a linear relationship with student outcomes.

The structure of the course was designed to give the participants two strong communities of practice (Wenger 1998 1999) where they would have the chance to build their teacher identities: their disciplinary and working context (their faculty or unit) and the teacher education context (the course). This was in order to make concrete Wenger's original idea of "brokers", where those who belong to many different communities of practice are considered the most creative. In this sense, these university teachers had the potential of being or becoming creative in developing teaching in their teaching contexts. To Wenger (1998), learning is fundamentally social and context dependent; learning is to negotiate new meanings. The way we understand and define the concept of learning influences all aspects of

educational practice. Giving a central role to the negotiation of meaning is also consistent with Taylor and Rege Colet's (2009) suggestions that for educational development to take place we need theory, practice and shared discussion. Similarly, developing expertise, according to Tynjälä's (2008) integrative pedagogy model, requires not only theory and practice but also self-regulation and reflection. The shared discussion suggested by Taylor and Rege Colet may serve in Tynjälä's model as the mediating reflective tool through which theory, practice and self-regulation can turn into special expertise.

Reflection is often seen as a key skill for teachers to develop their teaching. In his classic work, Schön (e.g. 1983) referred to reflection-in-action and reflection-on-action. For a teacher, reflection-in-action would mean active reflection during actual teaching and reflection-on-action would mean reflection after actual practice. To this Eraut (1995) has added the idea of reflection-for-practice, which would mean reflection about teaching before it takes place.

Furthermore, the means and methods of supervising and tutoring in a learning context were considered and discussed with the prospective tutors in great detail before the course started. Different kinds of models and ideas of tutoring and supervising (e.g. Barab, Barnett, and Squire 2002, Barrows and Tamblyn 1980, Hirsto 2004, Hirsto and Siitari 2004a, Hirsto and Siitari 2004b, Maudsley 1999, Schmidt and Moust 1995, Stokes 2003) were compared, and a shared idea of tutoring was negotiated. For example, in this negotiation the degree to which the course would rely on student and group self-regulation or tutor regulation as well as the focus of process vs. content tutoring were considered.

3. The course design

The students were informed about the pedagogical design and approach of the course in both the application material and the interview included in the entrance procedure. The course supervisors followed the progress and processes of the groups through face-to-face sessions and an e-platform where individuals and groups reflected on their learning processes and jointly built their inquiry processes and artefacts.

The course had five quite general learning outcomes, which were outlined in advance. First, the participants were to gain the ability to work as active members in an educational development group. Second, they were to be able to discern teaching and learning based on research. Third, they were to become acquainted with different research methods and use one method in an inquiry project. Fourth, they were to work in a multi-disciplinary group and be able to recognize group processes. Finally, the participants were supposed to be able to evaluate their actions in group project and support the group in reaching its goal.

The participants engaged in participation in two intensive, self-regulated small-groups (called inquiry groups). The learning tasks were divided into individual and group artefacts. The inquiry groups had to complete a written report on their collaborative inquiry theme and individuals had to write a written report about

their personal developmental projects. At the beginning of the course, the groups were asked to build their collaborative and individual inquiries in such a way that they would support each other. Both of these projects were discussed in the teaching sessions and inquiry group meetings.

The course was designed to last for one year and produce 20 ECTS. In this case, collaborative learning was seen to be embedded in the community of the small group (inquiry group), the whole course group and the community in which the participants worked at the university. The course was taught in Finnish.

Figure 2 presents the overview of the course. The "Group process" line in Figure 2 presents the working process of the research group. The students took care of cohesion, interaction and the atmosphere in their group to ensure the systematic and productive progression of group work. They also set their own goals, planned their studies, built their knowledge, and jointly reflected on and evaluated their learning and group processes. The groups met on face-to-face days and as often as they considered it necessary between these days. The groups wrote their reflections in a web-based learning environment every time they met. The participants' written reflections enabled the teachers to monitor the phases of the group processes and situations in the groups.

The "Individual process" (Figure 2) represents the process of individual work-place learning. At the beginning of the course, the participants discussed the course with their colleagues at their workplace and negotiated the educational development task or project to be planned and implemented during the course.

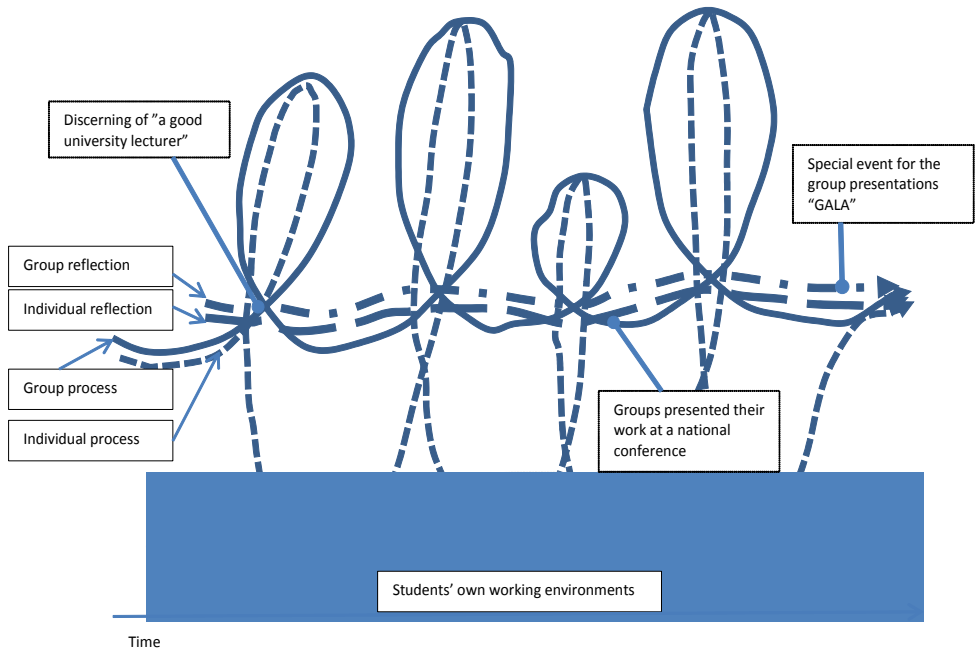

Figure 2. The cyclical processes of the course and the main predefined tasks.

The tutoring process was the main support structure in this course. The instructors tried to enable a constructive learning environment in which learning could occur in social interaction.

The two inquiry groups started their processes by defining the idea of "a good university teacher". Through negotiating their shared understanding, these groups also chose the theme for their collaborative inquiry. The groups were also asked to prepare presentations on their inquiry themes to be given at a national higher education conference, and to organize a final seminar and presentations at their own university at the end of the course.

There were 12 face-to-face teaching sessions, and the small study groups always met between the face-to-face sessions to enhance the work of both the group and its members. Table 1 presents the themes of the face-to-face teaching sessions. The first few sessions were partly predesigned, and their themes concerned the actual ways of working during the course as well as the question of what it means to be a good teacher. Reflection has been thought to be a key element in teacher competence (e.g. Schön 1983), and the discussions showed that the students needed help in reflection, which is why the theme was chosen for a more thorough discussion in the early stages of the course. The fourth session was intended to support students in their developmental work in their own unit. When the groups actually started doing their research projects, it became clear that qualitative methods were unfamiliar to the students with an engineering background, even though they had at least 20 ECTS credits in pedagogical studies behind them. These students were uncertain about decision making in qualitative research; therefore, they were given a seminar on the most common qualitative methods in the sixth teaching session. Otherwise the teaching sessions included peer-group work in different combinations, in order to allow the two inquiry groups to facilitate and share knowledge with each other. In addition, the inquiry groups interviewed a number of experts about their inquiry themes.

Table 1. The themes of the teaching sessions

Teaching session	Themes
1)&2)	Collaborative inquiry-learning* & group processes* & collaborative negotiations about what makes a good university teacher*
3)	Reflection*
4)	Workplace learning (Communities of Practice)*
5)	–
6)	Qualitative research methods
7)	The meaning of a curriculum in academic communities
8)	PedaForum-conference*
9)	–
10)	Idea of Future Learning Environments (FLE)
11)	–
12)	-GALA

*Predetermined themes

In this article, the original definitions and constructions of a good university teacher are used as the context in which both the learning paths and processes and the learning outcomes of the participants are investigated. The research questions were the following: 1) What kind of perceptions did university teachers as course participants have of their own personal learning paths and learning outcomes in a process-oriented teacher education program? 2) How did they feel the reflected learning outcomes compared with the predefined learning outcomes for the course?

4. Method

The participants were 16 junior and senior university lecturers from different fields of study in engineering and economics. Seven were female and nine were male. The data were collected from the participants during the year-long course. Two of the participants gained employment elsewhere and had to leave the course.

The data were collected through questionnaires completed by the course participants (N = 16) at the beginning of the programme (n = 16) (January), in the middle of the program (n = 15) (June) and in the end of the program (n = 12) (December). The questions were open-ended and concerned the participants' role in their working environment, their learning path and the process of becoming a good university teacher, the significance of the group for their learning, perceptions about tutoring, and their views of themselves as reflective practitioners. The questionnaires were administered during the face-to-face teaching sessions, but the participants were allowed to return the completed questionnaires either by email or at the next teaching session.

The data also included the groups' reflections after almost every face-to-face teaching and small group session (electronic logs g1 = 22 and g2 = 28) during the learning process about their groups' learning paths.

The groups' electronic logs were originally intended to reflect and record thoughts about the group's progress in their inquiry and questions and related ideas and insights, as well as group dynamics and functioning. The groups were also asked to write about their action plan for the next possible meeting. The groups also used the format of Gibbs (1988) reflective debriefing cycle, which includes six stages: description, feelings, evaluation, analysis, conclusion and action plan.

The aim was to investigate the reflections of the participants on their individual learning paths and learning outcomes and complement these viewpoints by analysing the joint reflections of the groups during the course. All the answers to the questionnaires were read through several times using content analysis, where two of the researchers first analysed the data individually, and then a common understanding was negotiated (co-researcher dialogue). Learning outcomes were emphasized in the participants responses towards the end of the course, but some issues clearly evolved early on in the course.

4. Results

The results are presented by first displaying the original definitions of a good teacher together with the chosen collaborative inquiry questions. Then, the participants' reflections on their own learning are analysed. Finally, the self-assessed learning outcomes are investigated in relation to the predefined learning outcomes of the course.

4.1. Original definitions of a good teacher and foci of collaborative inquiries

At the beginning of the course, the two inquiry groups were given the task of discerning the idea of "a good university teacher". Through the process of negotiating their shared understanding, these groups also chose a theme for their collaborative inquiry. These observations were analysed in relation to the formulations of the themes or categories developed during negotiations and reflected in the groups' e-platform (Figure 3 and Figure 4).

Others	**Expertise**	**Students**
-environment -collaboration with society and interest groups	-own field of expertise -pedagogical, psychological knowledge -collaboration with colleagues -knowhow on learning processes -continuous change and development -supervision and tutoring -teaching methods **University** -time for teaching as well as for research -possibilities to plan own work -creates a motivating learning environment -critical reflection -motivation -feedback skills -open communication -listening **Personal characteristics**	-scientific community -up to date research -understanding the needs of students -supports the learning processes of the students -developing courses according to student feedback -activates students -encourages students in difficult subject matters -good attitude towards students -motivating students through inspiring learning environments -caring for students

Figure 3. The original conceptualization of a good teacher (Group 1).

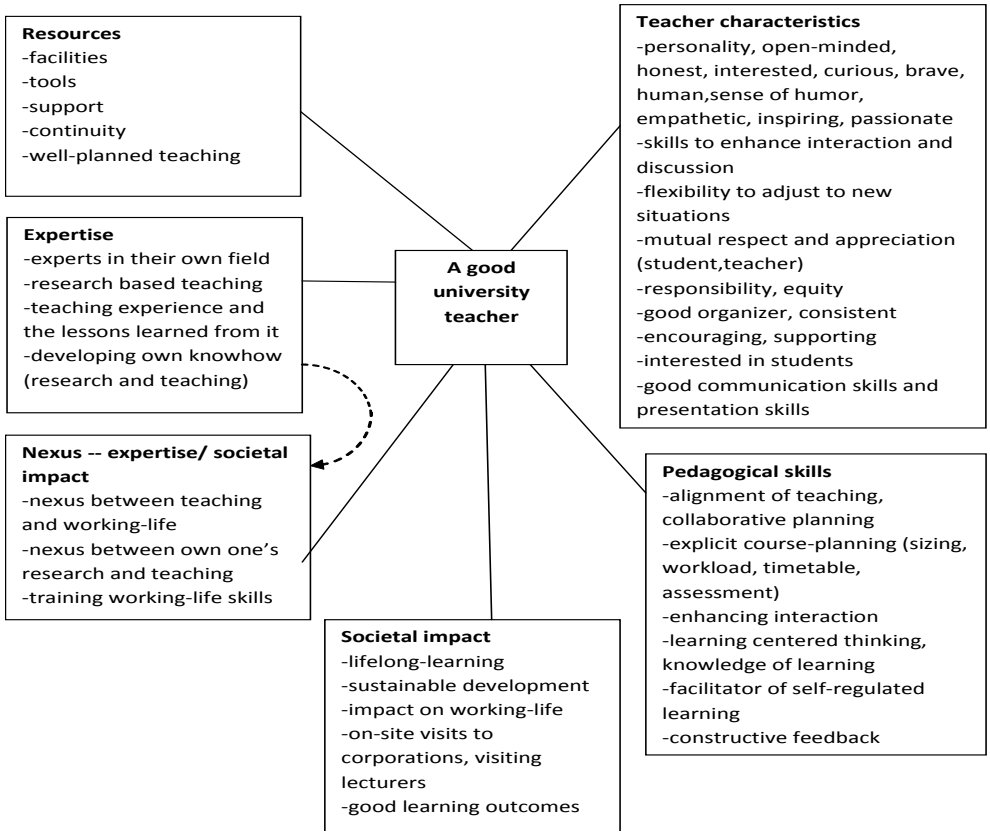

Figure 4. Original conceptualization of a good teacher (Group 2).

On the basis of their conceptualization and mind-map, Group 1 decided to focus their collaborative inquiry on the joint theme of *motivation and expertise*. The sub-categories of the theme included the relationship between teaching methods and learning, research evidence on the relationship between students' active orientation, motivation and academic achievement, teaching generic skills and developing the students' expertise, developing expertise by learning by doing, achieving the learning outcomes, degree level curriculum work (learning outcomes, suitable teaching methods), facilitating students' motivation in learning situations, the students' responsibility for their own learning and the teacher's responsibility to motivate them, the potential of project based learning to enhance motivation and achievement of degree level learning outcomes, and better integrating research and teaching.

On the basis of their conceptualization and mind-map, Group 2 decided to focus their collaborative inquiry on the theme of the *holistic planning of education from the perspective of university students.* The preliminary inquiry sub-questions in Group 2 included the contextual investigation of holistic planning, a student-

centred approach in planning processes, and the role of integrative thinking about research and teaching in holistic educational planning. Group 2 also planned to integrate the perspectives of a learning organization, research-based learning and learning outcomes into their inquiry.

The two inquiry groups produced two different, but also somewhat similar, mind-maps about their idea of a good teacher. The instructions for both groups were similar, but the initial definition of a good university teacher seems to have had a different focus. The first group had a more general approach and the other a more contextualized approach. However, when analysing the inquiry questions, both groups incorporated general and contextualized perspectives. The first group included context, for example, in degree-level questions and project based learning, and the second group included general perspectives in the student-centred approach, the nexus between research and teaching, a learning organization and research-based teaching.

According to these mind-maps and questions defined for the collaborative inquiries, it seems that the university teacher groups defined what it meant to be a good university-teacher quite thoroughly and chose the focus for their collaborative inquiry in a contextualized way. Thus, it seems that the participants were able to formulate the framework for their curriculum in a meaningful way.

4.2. Participants' reflections on their own learning

On the basis of the analysis of their responses to the questionnaires, the course participants' perceptions of their learning paths were classified into four themes: 1) empowerment, 2) skills and knowledge, 3) group work and 4) network. These categories are not mutually exclusive; rather, they represent the themes that were found in the participants' answers. For example, empowerment also seemed to be related to developing know-how, and thus to the categories of skills and knowledge as well as network. Empowerment included students' views on building a stronger teacher and developer identity. The participants also felt that the course enhanced their role as educational developers in their working community. Here are some examples of the data translated from Finnish:

> *"In my disciplinary area, I am one of the leading educational developers. Nevertheless, in a professor-centred administration culture the possibilities for lecturers to have an effect are indirect. My role and position [as an educational developer in my working community] have become significantly stronger and deeper. I am now a member of [the local educational development committee], which has made my knowledge and capabilities more official."*(m2, December)

> *"Especially my own identity as a teacher has become stronger during this year. This has given me courage to act as a teacher, which means taking more responsibility for teaching, setting clearer goals, better understanding human beings and their reasoning and acknowledging that."* (m8, December)

> *"Getting to know very different kinds of good teachers has concretely shown me that one can be a good teacher in many different ways. One should, as much as*

possible, adjust his/her own strengths to teaching methods that are natural and suitable for oneself." (f4, December)

Skills and knowledge included the students' view that they had expanded their understanding of teaching, being a teacher and educational development. They had also developed their skills in acting as reflective practitioners and their skills of research-based development (the scholarship of teaching).

"During the last year I have developed in managing and understanding larger entities inside [my university].This perhaps does not show directly in my teaching, but it has had concrete effect in planning."(m2, December)

"I have always been a "natural" reflecting person. One of the things the course offered was the chance to contemplate the working of our group through reflection as well as our own behaviours as group members. I had not practised anything like that and I realised that it was useful. I have started to reflect on my own behaviour as a supervisor and a member of a research group, also more widely on my own research work." (m2, December)

*"I have been able to widen my perspective about what it means to be a good teacher during this year. The contact days, visitors, group discussion, reading literature and interviews included in the collaborative inquiry have widened my perspectives on good teaching. I now know better where to look for information concerning educational development. Also, preparing a scientific presentation about education for an international conference [in my own field] based on our educational development task has helped to develop my teaching skills. It has been intriguing to have been able to do research related to educational development and to network with other colleagues. This was also supported by participation in a national educational development conference."(*f7, December)

The group work also included the participants' views on the significance of the group (providing support and space for pedagogical dialogue). The participants positively reflected on and evaluated group work based on collaborative learning, and during their own group work they did not recognise the weaknesses or threats that they had mentioned in reference to group work in general.

"…It is good to have got to know people interested in educational development from different schools at my university. I hope that the collaboration can continue, for example through shared research projects related to educational development." (f7, December)

"Peer-support from other teachers has been important. We have heard how others do things and received comments and hints from others. This has given more certainty for my own work and teaching."(f6, December)

"Pedagogical thinking has developed and become more diverse on the basis of group discussions." (m5, December)

"[group discussions and collaborative inquiry] have affected my conception of good teaching so that the significance of teachers' collaborative dialogue has become stronger."(m7, December)

> *"[group discussions and collaborative inquiry] have affected my conception of a good teacher enormously. I especially feel that this sharing of experiences and collaborating helps to piece together the field of teaching."* (m1, June)

> *"Working in group has been educating in many ways. On the one hand, the group provides a versatile knowledge base at the beginning of the course. Getting wider conceptions may, nevertheless, be the bigger advantage of the group. Through this, the group has made a significant input to my conception of good teaching. I simply could not have thought of all the perspectives that evolved in the group."* (m6, June)

The network theme included students' feelings of widening their network with teachers from other fields and also the feeling of them having a potentially more stable collegial network.

> *"A wider network between different schools [at the university] gives good support, for example, for discovering and evaluating different kinds of practices."*(f4, December)

4.3. Reflections on learning in relation to the predefined learning outcomes

To determine and evaluate how the predefined learning outcomes for the course were met, the reflection themes we found were compared to the initial learning outcomes (Figure 5). It seems that participants' reflections on their learning gains fell nicely into the themes of the predefined learning outcomes.

The first learning outcome, "the participants have the ability to work as active members in educational development group", seems to have been achieved both through collaborative inquiry on the course and through the participants' enhanced roles in their working environments. It seems that empowerment has given many of the participants the courage to take a more active role and also led to their being given more significant roles in, for example, educational development committees. The development of their skills and knowledge also gave the participants the courage and self-esteem to be active in educational development matters in their working environments. The group as a space for pedagogical dialogue and support was considered important for helping the participants to take a more active role in educational development both at the departmental level as well as in the network created by the course.

The achievement of the second learning outcome, "the participants should be able to discern the phenomena of teaching and learning based on research", seems also to be supported by the participants' reflections on their enhanced understanding of teaching and educational development. Moreover, the participants' experiences of the development of their skills as reflective practitioners and the development of their skills in research-based development support the achievement of this outcome.

The achievement of the third learning outcome, "the participants should become acquainted with different research methods and use one method in their own research", seems to be supported by the participants' reflection on the improvement of their skills in research-based development (the scholarship of

the participant has ability to work as an **active member in educational development group**	she/he is able to **discern the phenomena of teaching and learning based on research.**	she/he has become **acquainted with different research methods** and used one method in one's research project	the participant has **worked in multi-disciplinary group and is able to recognize phenomenon of group processes**	the participant is able to **evaluate her/his action in a group work and is able support group work to reach its goal.**
Empowerment				
–Stronger teacher and developer indentity –Role as educational developer enhanced in the work community	–Stronger teacher and developer indentity –Role as educational developer enhanced in the work community			
Skills and knowledge				
–Expanded understanding of teaching, teachership and educational development	–Expanded understanding of teaching, teachership and educational development			
–Skills of acting as a reflective practitioner developed	–Skills of acting as a reflective practitioner developed		–Skills of acting as a reflective practitioner developed	–Skills of acting as a reflective practitioner developed
–Skills of research based development improved (scholarship of teaching)	–Skills of research based development improved (scholarship of teaching)	–Skills of research based development improved (scholarship of teaching)		
Group work				
–Important meaning of the group (providing support and space for pedagogical dialogue)		–Important meaning of the group (providing support and space for pedagogical dialogue)	–Important meaning of the group (providing support and space for pedagogical dialogue)	–Important meaning of the group (providing support and space for pedagogical dialogue)
–Participants reflected on and evaluated group project positively based on collaborative learning. But they did not recognise in their own group work the weakness or threds that they menitoned generally.	–Participants reflected on and evaluated group project positively based on collaborative learning. But they did not recognise in their own group work the weakness or threds that they menitoned generally.		–Participants reflected on and evaluated group project positively based on collaborative learning. But they did not recognise in their own group work the weakness or threds that they menitoned generally.	–Participants reflected on and evaluated group project positively based on collaborative learning. But they did not recognise in their own group work the weakness or threds that they menitoned generally.
Network				
–widen network with teachers from other fields –Potentially more stable collegial network			–widen network with teachers from other fields –Potentially more stable collegial network	

Figure 5. Cross-tapping of the original learning outcomes and actual achieved learning outcomes.

teaching); the high significance given to the group in providing support and space for pedagogical dialogue can also be seen as evidence of this learning outcome. However, some participants also felt that they needed more support for this learning outcome. The reason research methods, especially qualitative research methods, were one of the prominent themes of the course was the clear need for them which arose on one of the contact days. Issues of methodology were also discussed during the supervising sessions. However, it seems that some of the participants needed more support from the supervisors in this sense.

> *"The last two weeks have shown how difficult it is to write scientific-like text from weak material (one cannot perhaps call the data we collected real science; I think that some others in my group think alike), which is from a different discipline."* (f1, December)

The achievement of the fourth learning outcome, "the participants are to have worked in a multi-disciplinary group and are able to recognize group processes", seems to be supported by the group working and networking themes and also by the reflective practitioner theme.

The achievement of the fifth learning outcome, "the participants should be able to evaluate their actions in a group project and be able to support the group to reach its goals", seems to be supported by the themes of group work and also by the skills of the reflective practitioner. Many participants used what they had learned to reflect on their own behaviour in the group. Furthermore, experiences of flow were reported throughout the course. However, some felt that this group was somehow special in its motivation, and reflected on the significance of selecting students to this kind of course.

> *"This course turned out well, but the significance of student-selection still makes me think. On regular courses it is rare that students' motivation and commitment is at such a high level as on this course."*(m2, December)

> *"I wonder what this course would have been like if everything had gone wrong? In [our group] we avoided conflicts knowingly /unconsciously and there was exemplary mutual encouragement. There was evidently a consensus that we could not have beaten the group's performance by working alone."*(m2, December)

5. Discussion and implications for practice

The analysis of the students' own free reflections shows that the learning outcomes were met and even exceeded in many ways. The students were clearly empowered as teachers and members of their own units. They felt that they had acquired a strong and important network of university teachers. Moreover, both groups' original observations and negotiated themes for the collaborative inquiries seemed to represent the broad field of teaching and learning. The inquiry-groups were able to produce scholarly articles on their themes. The groups had a different focus to their inquiries but, nevertheless, seemed to incorporate similar themes. One group approached their collaborative inquiry theme from a more or less inductive perspective, starting from the individual student, while the other group used more of what could be called a deductive approach, by focusing on holistic planning.

The learning outcome themes produced by the participants were not the same as the predefined learning outcomes, but they were highly related. Thus, it seems that this kind of long, process-oriented curriculum may also achieve predefined goals even when the content is not set. However, it is important that certain processes and supporting structures, as well as the learning environment, are well planned. Moreover, the way tutoring and supervision is planned and arranged is important. It seems that the participants had different kinds of expectations for tutoring in different phases of the various group processes. There were students who thought that more direct or concrete instructions would have been an insult to the group and an implication that they were insufficiently capable. On the other hand, there were students who would have liked to have received more direct instructions. It seems that extreme flexibility is required of the tutors and

supervisors on this kind of course in balancing between active and passive tutoring and control and freedom (cf. Lakkala 2010).

According to the experiences of the participants, it seems that 20 ECTS credits, which equals approximately 540 hours of work, is a relatively large amount of study, if it needs to be completed alongside regular academic work and teaching. However, a few participants suggested that it would have been good if the course had lasted a few months longer. According to those students, it would have given more time for them to finish the collaborative inquiry in a better written form and possibly reflect more on the work of the other inquiry group.

Another issue that was raised by some of the students was that the summer holiday seemed too long a break in the middle of the course. One suggestion was that it would have been good if a more formal research deadline had been set for the end of May. However, it was also mentioned that the end of May was very busy for lecturers, with finishing courses and evaluating student work. A collaborative endeavour at the end of the spring semester, producing some sort of concrete collaborative work, would, according to some of the students, have helped the groups to continue their work at the beginning of the autumn semester. Individual inquiries seemed to be supported in this way by the task of preparing presentations for the national educational development conference in August. Nevertheless, the learning environment and the designed processes of this course seem to match the eight different team learning processes of sharing, co-construction, constructive conflict, team reflexivity, team activity, boundary crossing, storage and retrieval that have been suggested by Decuyper et al (2010) to be interrelated and essential for team learning.

A third issue which needs further reflection is the theme of research-based educational development. The participants on this course were researchers themselves, and some of their ideas about the collaborative inquiry and what it would produce seemed to resemble the idea of a robust research article (see one of the quotes above). The level of expectations for the research should probably have been elaborated upon in greater detail. The idea of the scholarship of teaching (e.g. Boyer 1990, Kreber and Cranton, 2000) includes the idea that teachers' own experiences and developmental practices should be made public in one form or another. In the early stages, this does not require the skills to write educational research articles or the skills to use educational research methods to their fullest; instead students are expected to start the journey of literally reflecting on their own teaching and using research in the analysis, reflection and development of their own teaching practices.

Furthermore, the procedures and processes of reflection and the reflective practitioner were unfamiliar to many of the participants. This was noticed during the early stages of the course, and some more explicit instructions were given to them. The challenge was, however, that the participants came from different scientific backgrounds. This meant that some students were more used to reflecting on their own actions as students than others. It seems that it is really important

to consider the background of participants and pay more attention to supporting the process of their becoming reflective practitioners.

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CHINESE UNIVERSITY TEACHERS' EXPERIENCES OF A FINNISH UNIVERSITY PEDAGOGICAL WORKSHOP

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Abstract. The purpose of this study is to investigate Chinese university teachers' experiences of a Finnish university pedagogical workshop. The qualitative research data were collected from the participants' learning journals and feedback. The findings reveal that Western educational practices cannot be imported as such, but have to be adapted to the Chinese culture. In a multicultural training, participants may face challenges that remain unrecognized by the educators. Similarly, participants may expect educators to behave in a manner that is unfamiliar to the educators. In order to further develop worthwhile tools for teaching and learning in the Chinese context, there is a need for collaboration between educators and participants. The findings of this study have practical implications for higher education related to developing university pedagogical training in multicultural and multidisciplinary contexts. In particular, the study generates new information for pedagogical cooperation projects between Western and Chinese universities.

Keywords: transnational higher education, pedagogical training, teacher training, collaborative pedagogical programme, reflection, learning journals, China, Finland

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1. Introduction

Western universities are cooperating with universities in Asia in increasing numbers (e.g. Ennew and Fujia 2009). China and India, in particular, have been the countries of interest to foreign higher education institutions (Yang 2008). According to Yang (2008), it is evident that both the scale of the foreign higher education activity in China and the extent of foreign commitment have been growing rapidly in recent years. Of the countries that encourage diverse forms of transnational higher education, China considers cooperation and partnership as important, and particularly encourages Sino-foreign cooperative institutions and programmes (Gu 2009). As an example of this trend, Aalto University (Aalto),

Finland and Tongji University (Tongji), China, have founded the Sino-Finnish Centre (SFC), which is a strategic cooperation project between Aalto and Tongji. As a part of the strategic partnership, the two universities have also agreed on a pedagogical collaboration project during 2012–2014. One form of this collaboration is pedagogical workshops (1–2 days twice a year) that are held in China by Finnish educators.

The Aalto–Tongji pedagogical collaboration operates in the field of "transnational higher education", a term that is widely used to cover education that a higher education institution organizes outside its home country. There are a number of studies on Asian or Chinese students in foreign universities (e.g. Watkins and Biggs 2001, Foster and Stapleton 2012, Gieve and Clark 2005) and transnational undergraduate study programmes in Asia (e.g. Yang 2008, Dunn and Wallace 2004). There is also a growing body of studies on transnational teaching (Smith 2009), and in addition, there are some sporadic studies on preparing teachers for transnational education (e.g. Haley and Ferro 2011). However, no literature on transnational pedagogical training of university teachers was located. Thus, the present study has been designed to address this gap. It also seems unique that two universities from two different continents collaborate in teachers' educational training which is the case in the Aalto–Tongji pedagogical collaboration programme.

2. Theoretical background

2.1. Transnational higher education

There is no agreement on what exactly should be included in the concept of transnational education (e.g. Yang 2008, Adam 2001). An often-cited definition is the wording by the UNESCO/European Council Code of Good Practice in the Provision of Transnational Education (2001):

> *All types of higher education study programmes, or sets of courses of study, or educational services (including those of distance education) in which the learners are located in a country different from the one where the awarding institution is based. Such programmes may belong to the education system of a State different from the State in which it operates, or may operate independently of any national education system.*

Here, the educational services include, among others, "training modules that lead to professional development" (UNESCO 2001). The Aalto–Tongji pedagogical workshops studied in this paper can be regarded as fitting in this category.

Depending on what or who moves cross borders and where the qualification is awarded, Knight (2003) has identified four categories for cross-border education: people, providers, programmes, and projects and services. Based on this categorization, OECD (2006a) has named and described three mobility forms, i.e. people mobility, programme mobility, and institution mobility:

- A **person** can go abroad for educational purposes (people mobility).
- An **educational programme** can go abroad (programme mobility).
- An **institution** or **provider** can go or invest abroad for educational purposes (institution mobility).

(OECD 2006a: 23-24)

Regarding these mobility forms, people mobility and institution mobility involve foreign awards granted by a foreign institution, whereas programme mobility involves domestic, double or joint awards (Knight 2003). Knight's (2003) fourth category for cross-border education, projects and services, involves a wide range of education related projects and services, but it does not involve any award-based programmes. Regarding the OECD (2006a) mobility forms, projects and services may be included in all three mobility forms. While student mobility embodies the bulk of cross-border education, transnational higher education in the form of institution mobility has remained relatively rare, albeit growing strongly (OECD 2006a, 2006b). However, programme mobility is growing much more quickly than institution mobility (OECD 2006b).

Four general approaches to transnational postsecondary education can be detected: mutual understanding, skilled migration/developing human resources, economic revenue generation, and capacity building (Gu 2009, OECD 2006b). In the mutual understanding approach, countries seek openness to the world and strengthened ties between countries through the creation of international networks (OECD 2006b). In contrast, in the three remaining approaches, transnational higher education can be seen as a means to support economic growth and competitiveness in a knowledge economy. In the skilled migration approach, the main target is to attract and develop human resources. The capacity building approach is an importer perspective that views transnational education as a means to meet an unmet demand as well as help build capacity for quality higher education (2006b). The economic revenue generation can mainly be considered an exporter perspective. Gu (2009) argues that for provider countries, generating revenue is the primary driving force, and thus highlighting competition. On the other hand, the receiver countries are keen on capacity building and the development of human resources, thus emphasizing cooperation. For example, according to Gu (2009:634), the main reason for developing transnational education in China "is to enhance the overall educational system, to diversify educational supply, to build capacity for colleges and universities, and to attract and develop human resources".

There are also some challenges and concerns associated with transnational higher education, including quality assurance, cultural appropriateness, the possible undermining of the public nature of education, and the possible loss of educational sovereignty (Yang 2008, Gu 2009). In particular, transnational higher education has been criticized for being insensitive to the local culture and educational traditions (e.g. Hu 2002, Pyvis 2011), and for prioritising economic revenues over the quality of education (e.g. Gu 2009, Lieven and Martin 2006, Yang 2008).

2.2. Reflection

Reflection is a concept that does not have one single definition. Boud et al (1985:19) consider reflection "a generic term for those intellectual and affective activities in which individuals engage to explore their experiences in order to lead to new understandings and appreciations". Furthermore, Boud (2001:10) argues that "Reflection involves taking the unprocessed, raw material of experience and engaging with it as a way to make sense of what has occurred. It involves exploring often messy and confused events and focusing on the thoughts and emotions that accompany them". Hence, reflection can be seen as a tool to make sense of and give meaning to unstructured and nebulous ideas or experiences. Moreover, the target of reflection is to turn experience into meaningful learning (Bourner 2003, Boud 2001).

The quality of reflection can be nurtured by introducing different types of structures, learning and teaching strategies, and prompts (e.g. Moon 1999, 2009, Nückles et al 2004, Hübner et al 2010). According to Nückles et al (2010), prompts (prompting questions) particularly support reflective writing when the students are unfamiliar with the learning journal method. One example of a structured model of reflection is Gibbs' (1988/2001) often-cited reflective learning cycle, where reflection is divided into six different stages: describing, feeling, evaluating, analysing, concluding and action planning. To support reflection, different prompts and instructions are given for each stage (Gibbs 1988/2001: chapter 4.3.5):

> *Description: What happened? Don't make judgements yet or try to draw conclusions, simply describe.*
>
> *Feelings: What were your reactions and feelings? Again don't move on to analysing these yet.*
>
> *Evaluation: What was good or bad about the experience? Make value judgements.*
>
> *Analysis: What sense can you make of the situation? Bring in ideas from outside the experience to help you. What was really going on? Were different people's experiences similar or different in important ways?*
>
> *Conclusions: (general) What can be concluded, in a general sense, from these experiences and the analyses you have undertaken?*
>
> *Conclusions: (specific) What can be concluded about your own specific, unique, personal situation or way of working?*
>
> *Personal action plans: What are you going to do differently in this type of situation next time? What steps are you going to take on the basis of what you have learnt?*

Critical reflection is a concept that is often regarded as the deepest form of reflection, which is also sought after in higher education (Dyment and O'Connel 2011, see also Kember 1997). According to Mezirow (1990:13), "Critical reflection is not concerned with the how or the how-to of action but with the why, the reasons for and consequences of what we do". Besides content and process of

learning, Mezirow (1991:104) also includes underlying premises as targets for reflection, when he considers reflection as "the process of critically assessing the content, process or premise(s) of our efforts to interpret and give meaning to an experience". According to Mezirow (1990), being exposed to different perspectives may initiate a process of critical reflection that brings to the fore an individual's own points of view and, if needed, sometimes leads to perspective transformations.

3. The present study

3.1. The context: pedagogical workshop

The aim of the current study is to investigate Chinese university teachers' experiences of Finnish university pedagogical training. The context is a pedagogical collaboration programme between Aalto University (Aalto), Finland, and Tongji University (Tongji), China. The collaboration programme is a part of a strategic partnership between the two universities, the main objective being to improve the quality of education in the multicultural environment in both universities. As a project in transnational higher education, the emphasis is on enhancing mutual understanding and developing human resources. To some extent, it can also be regarded as capacity building, because Tongji can partly tap into the pedagogical training brought by Aalto. However, because transnational higher education is very often associated with generating economic revenue as the main aim, it is worth highlighting that neither of the two universities seeks economic profit through this collaboration. The training can be considered unique in the sense that it is free of charge to the participants, and both universities cover their own costs, i.e. no fees are paid or received as tuition. The aim is to develop the pedagogical collaboration between the universities through mutual discussions and shared feedback from the participants. In addition, joint projects on research and teaching can be considered focal.

In the Aalto–Tongji pedagogical collaboration programme, Aalto provides pedagogical training for both the Finnish and Chinese university teachers (participants). Workshops are held in Finland and in China, and there are both common and separate workshops for Finnish and Chinese participants. The workshops are held in English. In May 2012, two Finnish educators from Aalto gave the first pedagogical workshop of the whole programme for 20 Chinese (Tongji) university teachers (i.e. teacher students) in Shanghai, China. Teacher students were selected by the Tongji HR department, and a particular criterion for selection was the participants' ability to communicate and study in English. The teacher students represented different fields and disciplines. The objectives of the two-day workshops were to highlight the participants' own conceptions of learning and determine how they are related to their teaching practices. In addition, the learning outcomes-based teaching, different teaching methods, and creativity in teaching were discussed. The intended learning outcomes of the workshop were expressed as follows:

After the workshop the participant will be able to

a) explain the meaning of conception of learning and its relation to university teaching,
b) describe how to design learning outcomes-based teaching (constructive alignment),
c) reflect on strengths and weaknesses of different teaching methods, and
d) use various activating and creativity inspiring teaching methods in practice.

In addition, to practice English language was a focal objective for the Tongji University, and thus two English language tutors also participated in the workshop. The tutors occasionally helped participants with the English vocabulary, but they did not need to act as translators, because all the participants were able to communicate in English. The workshop concentrated on such topics as conceptions of learning and teaching; competencies needed in the future working life (Biggs and Tang 2007, Liu 2010); teaching methods to be used to enhance the needed future competencies; constructive alignment (Biggs and Tang 2007); reflection and reflective writing. Most of the themes were novel for the participants. Teaching methods employed during the workshop included numerous activating methods, and there was a particular emphasis on various forms of group work activities. The workshop was held at the Sino-Finnish Centre of Tongji University, where the space is especially designed for group work activities and does not resemble a conventional lecture hall. Because the interior design was done by Finnish professionals, the interior of the space is more Finnish than Chinese.

3.2. Research questions

For this study, the following research questions were posed:

- What issues did the Chinese participants reflect on in their learning journals after a Finnish university pedagogical training/workshop?
- Were there particular elements (in the training) that were challenging to the Chinese participants?

4. Method

The qualitative research data were gathered from the Chinese participants' learning journals that were written after the workshop. Additional data were collected from the feedback gathered by Tongji HR department. In the following, both sources of data are described in more detail.

4.1. Learning journals

The Chinese participants were asked to submit their learning journals through an e-learning platform (Moodle) within three weeks of the workshop. Altogether eighteen (out of twenty) participants submitted their learning journals.

The basic guidance for journal writing included a suggested structure for a journal entry. The concept of reflection was explained and practised at the end of

the workshop, and prompts were given to help reflection. The guidelines mainly followed Gibbs's (1988/2001) model of reflective cycle, and the following prompts were given as a handout and also explained at the end of the workshop:

1. Description of the event
   - Describe in a few sentences the workshop (e.g. where were you; why were you there; what were you doing; what were other people doing; what happened.)
2. Feelings and thoughts: Try to recall and explore ideas or thoughts that were going on inside your head.
   - How were you feeling when the workshop started?
   - What were you thinking at the time?
   - How did it make you feel?
   - How did you feel about the outcome of the workshop?
   - What do you think about it now?
3. Evaluation and analysis
   - What went well?
   - What did you do well?
   - What did others (including the trainers) do well?
   - What went wrong or did not turn out as it should?
   - In what way did you or others influence this?
4. Conclusion
   - Review what you have written in the previous stages 1, 2 and 3
   - Try to detect any insights you gained (i.e. what did you learn) during the workshop. Remember that the purpose of reflection is to learn from experience. During this stage, you also should ask yourself what you could have done differently.
5. Action plan – Now what?
   - What could you do now (with the issues you have learned about during the workshop)?
   - What might be the consequences of this action?
   - Be as realistic as possible. Small realistic steps are better than huge unrealistic ones.

The learning journals were written in English, and the required length was 750–1500 words.

4.2. Feedback gathered by Tongji HR department

Complementary research data were gathered from feedback collected by the Tongji HR department. Information of the required feedback was sent to the participants straight after the workshop. Providing feedback was compulsory for all the teachers who had participated in the training. The feedback was written in Chinese, and it was gathered by e-mail within three weeks of the workshop. The required length was 1000 words. The questions to be answered in the Tongji HR feedback were:

1. What have you gained directly/ indirectly from this pedagogical training?
2. What do you think is the advantage of Finnish teaching methods?
3. What impressed you most that you think could be used in your own teaching?
4. Were there particular elements (in the training) that were challenging to you?
5. Could you please comment on this workshop according to your personal experience?

5. Analysis

The two sets of data, learning journals and feedback, were first analysed independently. The Finnish authors analysed the learning journals that were written in English, and the Chinese authors analysed the feedback written in Chinese. Finally, the findings based on the two sources of data were put together by the Finnish authors for further discussion and conclusions. The processes of analyses are explained in the following.

5.1. Analysis of the learning journals

The learning journals were analysed using qualitative thematic analysis. The relevant themes were identified from what respondents said (here: wrote), and selective quotations were presented as illustrations of each of the identified themes (Silverman, 2011). The two Finnish authors analysed and categorized the diaries individually. First, both authors read the diaries through several times and then inductively created themes out of the items about which participants had written. The analysis also involved regular references to the original texts in order to ensure correct understanding of the created themes. Through this sequence of analysis, each Finnish author individually created the initial framework for findings. Second, the authors discussed the findings to strengthen the credibility (Graneheim and Lundman, 2004). Unclear cases were discussed, and findings were amended and further defined based on these discussions. At this phase, the themes were further sorted under four categories as shown in Table 1.

5.2. Analysis of the feedback

Based on the two research questions, the two Chinese authors made a qualitative analysis on the feedback gathered by the HR department. First, the third author read through the feedback and underlined text passages that were relevant to the research questions. These text passages were marked as her findings. In case there was nothing to underline, the author also made a marking on that on the paper. Next, the fourth author read the same feedback and similarly underlined text passages that she considered relevant to the research questions. After this phase, the two authors cross-checked their findings paper by paper. In case the findings on a particular paper were the same, they moved over to the next

Table 1. Theme classification based on reflections

Sources of reflection:	Prompts given for learning journals	Substance covered during the workshop	Activities during the workshop	Other elements of the workshop
Themes reflected on	**Teachers' and students' role in the workshop** *"One thing which especially impressed me most is that the two Finnish teachers also participated in the warm-up exercises, and it seemed to me that they are part of us learners." P1*	**Constructive alignment (CA)** *"Through the learning of CA, I understood that teaching a class is not just to give a lecture, nor to make students discuss on topics. Teaching a course is a system made up of some related processes---" P7*	**Teaching methods in general** *"I see the teachers introduced this workshop and grouped us. Then, after the warm up, some questions are proposed for groups. I think we are playing a game." P9*	**Chinese context and comparison between different cultures** *"As a usual lesson in China, teacher will explain many; students sit there silently and listen. The same lesson in Finland, the main function for teacher is to guide the students. Discussion is very important in their teaching and learning." P18*
	Feelings *"When the workshop starts, I felt it is strange and fresh." P2,* *"All in all, any time when I thought of the two days' learning, my feeling was relaxing, enjoyable and positive."P7*	**Student vs. teacher oriented approaches** *"Finnish teaching and learning approach is the student-centered one and the teacher is regarded as a guide or an organizer which is little different from that of the Chinese approach that is the teacher-centered."P1*	**Group work and discussion** *"When we discuss what's a good teacher and prepare to draw he or her, we have large disagree with each other because everyone want to be the group leader. " P9*	**Physical and social learning environment** *"It amazed me that the arrangement of desks and chairs was different with that of common classrooms. The desks made a diamond shape that meant the training should be fruitful. The colorful chairs let us in a happy mood although it was rainy." P10*
	Challenges and critique *"Time passed quickly, and it is a pity that no lunch buffet was served." P13*	**Conceptions of a good university teacher and student** *"The elements which were much impressive for me are? What is a good university teacher? What is a good student?" P4*	**Collecting and giving feedback** *"I pay more attention to the feedback of student since I can reflect and adjust my teaching methods accordingly." P11*	**Teachers' outer appearance and manners** *"It's my first time to see 2 teachers in one class. Their perfect cooperation, graceful manners and broad knowledge impressed me deeply." P8*
	Applying learned issues in practice *"My class scale is similar with Sino-Finnish workshop this year, so it is convenient to introduce Finnish teaching methods in my class. " P6*			**English language** *"I tried my best to understand the English and recall my teaching experience--"P4*
				Networking *"I am glad to meet new people. I wish I can have a good experience with them." P9*
	Expected responses			**Unexpected responses**

one. Otherwise, the authors made a re-analysis together and discussed controversial issues in order to reach a consensus on the findings. After the authors had followed the same procedure with all the feedback, they translated their findings (i.e. the relevant text passages) into English.

5.3. Further analysis

The two Finnish authors continued the analysis by further categorizing the findings based on both the learning journals and the feedback. The result of this phase of analysis is shown in Table 2.

Table 2. Challenges and critique based on a different source of reflections

Challenges (CH) and critique (CR)

Based on the learning journals:	**Based on the feedback collected by Tongji HR:**
• English language (CH) • Some single teaching methods (CH) • Uncertainty of being able to apply the learned issues in practice (CH) • Practical arrangements of the workshop (CR)	• English language (CH) • Methods (CH/CR): time consuming not suitable for bigger classes not suitable for all subjects involvement of all students (free-riders) difficult • Applying the learned issues in Chinese context (CH) • Teaching vs. research (workload) (CH) • Too theoretical (CR)

6. Findings

According to the findings of the study, the Chinese university teachers were reflecting on fifteen different themes in their learning journals (see Table 1). In Table 1, each theme is illustrated by a quote. The quotes are in their original form (as written in the learning journals), and the number after the quote (e.g. P1) refers to the number of the participant in our database.

In Table 1, the themes (targets for reflection) are sorted as "expected" or "unexpected" based on their anticipated sources of reflection. The three expected sources of reflection were the prompts, the substance matters of the workshop, and the activities during the workshop. The prompts had elicited reflection on such themes as teachers' and students' role in the workshop; feelings; challenges and critique; and applying learned issues in practice. The second expected source of reflection, substance of the workshop, had initiated reflection on the concept of

constructive alignment; student- vs. teacher-oriented approaches; and conceptions of a good university teacher and student. Third, the activities during the workshop had triggered reflection on teaching methods in general; group work and discussion; and collecting and giving feedback. However, five (out of fifteen) of the detected themes of reflection could not be grouped under any of the three expected sources of reflection. Thus, the remaining five themes were labelled as "unexpected" because they were not highlighted by the prompts or the educators during the workshop, nor were they among the activities or intended learning outcomes. These five themes included reflection on the Chinese context and comparison between the cultures; the physical and social learning environment; the English language; networking among the participants; and the educators' outer appearance and manners. The free-form feedback written for the HR department could be grouped under the same themes as the learning journals.

Regarding challenges or critique of the workshop, the learning journals included only a few remarks. These findings are shown in Table 2.

Based on the learning journals, the detected challenges included the English language, some particular teaching methods, and the uncertainty of being able to apply the learned issues in practice. The only critique found in the learning journals concerned some practical arrangements: there had been a misunderstanding concerning lunch arrangements and thus no common lunch was served during the workshops. However, a challenge for one participant may have been a positive experience for someone else, as is illustrated by the following quotes.

Regarding the English language:

> *I chose a seat away from platform afraid of my poor spoken English.* (P15)
>
> *As time going on, I also find that it is not difficulty for me to catch what they said, on the contrary, I can grab their conceptions and actions very well in spite that I cannot catch every word they pronounced. It seems inconceivable, but it is the real case happened on me and other attendees.* (P3)

Regarding a single teaching method:

> *Kirsi and Maija required us to express our ideas by different ways, some methods were difficult for us, such as to draw the ideal teacher in our mind. So it is a difficult class too!* (P4)
>
> *As to the training, drawing a prototype of a good university teacher was very interesting, we discussed the image in all view-angle, clothing, the gesture and the glasses are all considered -- and finished the picture. All the team members were very satisfied with the work we done.* (P2)

Regarding applying the learned issues in practice:

> *Since in China, the students amount, and the space and time limitation will bring forward new problems compared with western countries, we should combine the ideal situation in theory with the real situation in China.* (P11)
>
> *I used to think that in China, big class with 40 students could not achieve ideal result by group discussion – I now realize that it is still possible to achieve good result by way of group discussion. The question is how to arrange time*

> *scientifically. I tried this after the workshop and have achieved an ideal result.* (P5)

In the feedback gathered by the HR department, the reported challenges were similarly scarce and they touched on similar issues as mentioned in the learning journals, i.e. the English language, issues concerning the teaching methods, and applying the learned issues in the Chinese context.

7. Discussion

This study explored what issues the Chinese teachers reflected on after a Finnish university pedagogical workshop, and whether there were particularly challenging elements in the training. According to the findings, the Chinese participants reflected on fifteen different themes that were categorized as expected or unexpected. The expected responses stemmed from the substance and structures of the workshop, while the unexpected responses were related to themes that could not directly be traced to the intended learning outcomes or structures of the workshop. The unexpected responses included reflection on 1. differences between Finnish and Chinese (learning) cultures; 2. physical and social learning environment; 3. the Finnish educators' appearance and manners; 4. networking; and 5. English language. Upon closer examination, the first three themes include elements of comparison, and thus, they very likely stem from a positive "culture clash" caused by the Finnish educators and the unusual learning environment.

Overall, the Chinese teachers wrote very little about challenges associated with the workshop. Similarly, criticism towards the training was scarce both in the learning journals and the feedback collected by the Tongji HR department. The few expressed challenges were associated with the English language, some single teaching methods, and hesitation about applicability of the learned issues in the Chinese context. All these were mentioned both in learning journals and in feedback. However, the feedback nevertheless included more critical comments than the learning journals, and the experienced challenges were also explained in more detail. This may indicate that the Chinese teachers wanted to be polite to the Finnish educators and therefore refrained from negative comments in their learning journals.

It is worth highlighting that although learning journals and the concept of reflection were novel approaches to the Chinese participants, the quality of reflection in the learning journals was nevertheless adequate; in some cases, it could even be regarded as critical reflection (Mezirow 1990, 1991; see also, e.g. Kember et al. 2008, Clarkeburn and Kettula 2012). As argued earlier, being exposed to different perspectives may start a process of critical reflection that makes a person more aware of his or her own beliefs and hidden presumptions (Mezirow 1990). Hence, because of the mismatch between the Chinese teachers' expectations and the Finnish educators' way of training, it seems that the workshop had acted as an incentive to critical reflection.

There are also some limitations associated with the study. First, because the study was built on rather short learning journals and pieces of feedback, the amount of research material was quite limited. Second, in order to show courtesy, the Chinese teachers may have been tempted to only write about the positive outcomes of the training. On the other hand, the feedback gathered by the Tongji HR department supported the findings based on the learning journals. Third, the methods of analysis of the two data sets (learning journals and feedback) deviated from each other, and thus there may be a risk of a mismatch between the findings. In addition, the feedback data had to be translated from Chinese to English, and this may have affected the findings.

Because one aim of the collaboration was to lower educational/pedagogical boundaries between the two universities, further studies are needed on the reflections written by the Finnish participants. In order to enhance cultural and pedagogical understanding, future research is warranted to determine whether the Finnish and Chinese participants' reflections are similar or whether they differ from each other. In addition, it would be worthwhile to establish what impacts the cooperative nature of the Aalto-Tongji pedagogical collaboration may have had on transnational education.

8. Conclusions

The Chinese university teachers' reflective writings reveal that the Western (here Finnish) educational practices cannot be imported as such, but they have to be adapted to the Chinese context. Furthermore, in a multicultural training, the participants may face challenges that remain unrecognized by the educators. Similarly, the participants may expect the educators to behave in a manner that is unfamiliar to the educators. These finding are supported by several earlier studies (Watkins 2000, Nguen et al 2006, Hu 2010, Heffernan et al 2010, see also Dunn and Wallace 2004) indicating that in transnational education, there may be some prevailing traits in the receiving culture that should be taken into account when planning and conducting tuition. However, it is worth noting that in the current study, a certain amount of unfamiliarity – and even small culture clashes – seemed to have acted as a stimulus for reflection on teaching and learning in the Chinese context. As argued earlier, being exposed to different perspectives may trigger critical reflection on hidden presumptions or structures (e.g. own cultural background or learning culture) (Mezirow 1990). In the Aalto–Tongji pedagogical collaboration, the Chinese university teachers were in the position of "translating" the Western pedagogical solutions to their own classrooms. Thus, they most likely benefitted from critical reflection on the characteristics of the Chinese teaching tradition. When teachers became more aware of their own learning culture and the impact of cultural background on teaching and learning, they were better able to assess what can be built on the existing base, and what should possibly be changed in order to reach the wanted objectives. Thus, in the future transnational trainings,

it is worthwhile to deploy educational elements that trigger reflection. Furthermore, it may even be beneficial to retain some elements of unfamiliarity and diverse perspectives in order to further critical reflection.

The studied pedagogical workshop included several educational elements that were entirely novel to the Chinese participants. Interestingly, the Chinese teachers nevertheless regarded the concepts of constructive alignment (Biggs and Tang 2007) and student-centred/learning-oriented teaching approach (see e.g. Kember 1997) as applicable even after such a short training. This indicates that these concepts may be accessible in several different contexts. Similarly, reflection and learning journals were considered beneficial, although reflective writing was found difficult. However, as argued earlier, the learning journals written after the workshop were of adequate quality, which supports the view that structured reflection and guiding prompts can facilitate reflective writing although students were unfamiliar with learning journal method (see Nückles et al. 2010).

In conclusion, the findings of this study reveal that in order to further develop worthwhile tools for teaching and learning in the Chinese context, there is a need for a genuine collaboration between the educators and the participants. The findings have practical implications for higher education related to developing university pedagogical training in multicultural and multidisciplinary contexts. In particular, the study generates new information for pedagogical cooperation projects with Chinese universities and faculty. Furthermore, because the findings of the study add information on the Chinese university teachers' views on learning and teaching, the findings are also useful for Western teachers who collaborate and work with Chinese teachers and students.

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LEARNING FOR ENTREPRENEURSHIP IN HETEROGENEOUS GROUPS: EXPERIENCES FROM AN INTERNATIONAL, INTERDISCIPLINARY HIGHER EDUCATION STUDENT PROGRAMME

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Abstract. Although entrepreneurship education (EE) has gained popularity internationally, empirical work is scarce on the factors which influence the underlying learning process. This article presents the experiences of a European summer school where factors which contribute to entrepreneurial learning in interdisciplinary, intercultural student groups were elicited and analysed via student reflection. A total of 35 professional and scientific bachelor students from the Netherlands, Latvia and Estonia worked together in groups of five to develop initial business plans at a 10-day summer school. Heterogeneity – including disciplinary and cultural differences – contributed to learning within the groups but also caused confusion and misunderstandings in the entrepreneurship education context. Particularly the factors embracing members' knowledge, experiences and skills, problem solving and decision making and leadership showed dynamics which appeared to be specific to the context of EE. The results contribute to a better understanding of student learning in EE settings.

Keywords: interdisciplinary learning, entrepreneurial learning, reflective learning, entrepreneurship education, intercultural learning, reflection

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1. Introduction

Entrepreneurship education (EE) has gained popularity internationally (Katz 2003). Non-business higher education scholars are also increasingly acknowledging the added value of fostering entrepreneurial competence among students in light of new career paradigms and the need for lifelong learning (Nab et al. 2009). As a result, the number of courses, programmes, summer schools and positions in EE in Europe has grown rapidly (European Commission 2008). Nonetheless,

European research shows that 1) European graduates have a poor opinion of higher education as a contributor to their entrepreneurial competence (Allen and Van der Velden 2009); 2) the traditional teaching methods used by teachers such as lectures, literature reviews and examinations only contribute to a limited extent to student learning for entrepreneurship (Gibb 2002); 3) teachers find it difficult to effectively introduce the elements of EE (McCoshan et al. 2010); and 4) EE is seldom a priority in teacher education programmes (European Commission 2011).

From a scholarly point of view, most of the scientific work on EE has drawn upon Ajzen's theory (1991) of planned behaviour with an EE focus on the stimulation of entrepreneurial intentions (Krueger et al. 2000). EE should stimulate the development of intentions to start a business, which can be further predicted by antecedents as perceived behavioural control, social norms and attitudes (Krueger et al. 2000). However, work carried out from this perspective reveals little information about the underlying learning processes which either foster or hinder entrepreneurial learning. Greater insight into such factors is necessary from not only a theoretical point of view, as research on EE is a relatively young endeavour (starting in the 1990s), but also from a practical point of view as the aforementioned European challenges with regard to EE need to be addressed.

In order to help narrow this gap, we summarize the experiences of a European Summer School (ESS), which had the aim of developing entrepreneurial competence on the part of international students from a variety of non-management and non-business backgrounds.

The ESS challenged students to articulate personal entrepreneurial goals and ambitions, translate these into entrepreneurial projects and share these with other students via a wide range of learning activities. In order to disentangle the specific factors associated with the learning processes elicited by this ESS, the following research question was posed: *What factors are perceived by students to contribute to entrepreneurial learning within interdisciplinary, intercultural student groups*? To answer the question, the daily reflections of 35 students on the ESS activities were analysed.

2. Theoretical perspective

One of the first challenges in EE is defining the focus (Fayolle and Gailly 2008). EE can be mainly *about* entrepreneurship, just like chemistry or psychology are mainly about chemistry and psychology, respectively. Learning about entrepreneurship may thus include economic theory, social capital theory and trait or personality theory. However, EE can also be about independent venturing and thus learning enterprising behaviour and learning *for* entrepreneurship (Honig 2004). EE can help or stimulate nascent entrepreneurs to further develop their intentions and work out their ideas into a full blown business concept, model or plan (Ardichvili et al. 2003). Finally, EE can also be seen in the light of so-called intrapreneurship (Antoncic and Hisrich 2003), i.e. being

entrepreneurial *within* an existing organisation. This means having an eye for opportunities, being proactive, taking risks, being creative but also having sufficient self-regulation.

These perspectives have different learning foci and none of them provide an overarching learning theory or model which can be used to describe and understand learning within an EE context. Over the last decade this has resulted in the emergence of the concept of entrepreneurial learning (Cope 2003). As argued by many EE researchers, the most effective way to promote student entrepreneurship is to 'push' students into entrepreneurship by structuring the learning process as an entrepreneurial process (Hannon 2006, Hjorth and Johannisson 2007, Hynes 1996, Kearney 1999). Within a higher education entrepreneurial learning context, Rae (2003) speaks of opportunity-centred learning. Opportunity refers to the heart of entrepreneurship, namely the recognition, evaluation and pursuit of business opportunities resulting in new products, services or processes for the market or industry (Shane and Venkataraman 2000). In its rudimentary form, a business opportunity is often an ill-defined market need, product, service, technological advancement or invention for which a market has yet to be defined (Ardichvili et al 2003). Opportunity-centred learning then encompasses four interconnected processes: 1) exploring the opportunity, 2) relating the opportunity to personal goals, 3) planning to realize the opportunity and 4) acting to make the opportunity happen (Rae 2003: 545). Via investigation and discovery, students identify, select, explore and refine opportunities. They thus move from the development of ideas regarding an opportunity to a project which addresses the selected opportunity. The writing of a business plan is one possible outcome of this process. Having passed through the planning stage, students can then act upon their plan and realize the opportunity. Their learning during these stages has often an emergent, opportunistic, discovery-based and a highly social character. Furthermore, reflection on what is working and what is not working, how and just why but also what has been learnt and what will be learnt are important elements of opportunity-centred learning (Rae 2003).

Although Rae's definition provides a clear starting point for researching entrepreneurial learning, it does not completely capture the complicated nature of the phenomenon. A helpful model to cluster potentially important learning-related elements in a meaningful manner is the Biggs (1993) 3P or *presage*, *process* and *product* learning model. The model is an input-process-output learning model, which draws upon three bins of learning-related factors – *presage*, *process* and *product* factors – for understanding student learning. The model has been found to provide a good starting point in the context of school-based learning (Spelt et al 2006) but also in the context of learning in and for the professions (Tynjälä 2013).

In our research framework, *presage* factors are student factors and factors in the learning environment which can contribute to opportunity-centred learning. In our particular ESS context, the first prominent presage factor is the fact that the students are from different countries and have very different disciplinary backgrounds, which means that they bring a wide variety of knowledge, skills,

experiences and goals to the learning context. Studies of EE have found that students can indeed have a wide variety of entrepreneurial goals including learning to be more proactive or creative, preparing to inherit the family firm or building a high growth company (Lans et al. 2010, Täks et al. submitted). A second prominent presage factor is that students have to actually work from the start in interdisciplinary, intercultural groups. This is because teams are considered a major vehicle for new venture creation and known to be responsible for many successful start-ups today (Harper 2005). Building interdisciplinary and intercultural, collaborative learning environments, projects and programmes thus provides critical presage factors (Wilson 2008). As such in our research framework, we understand "interdisciplinary and culturally diverse groups" to be the following:

> *Two or more individuals who are from different disciplinary as well as national/cultural backgrounds, who have been assigned interdependent, entrepreneurial tasks and are jointly responsible for the final results, who see themselves and are also seen by others as forming a collective unit embedded in the entrepreneurial summer school and who manage their relationships within this context* (after Marquardt and Horvath 2001, Popov et al. 2012:303).

Process factors – or the central part of the 3P learning model – entail various learning-related activities (Tynjälä 2013). To go smoothly through the interconnected phases of opportunity-centred learning, the student must be the active participant in learning and not the teacher (Fiet 2000, Heinonen 2007, Jones 2006, McGill and Beaty 1992). Like entrepreneurship in reality, student learning during EE is also mostly socially-mediated learning and thus depends on collaboration and interaction with others. In our particular ESS context, this means working together with others who have very different disciplinary and cultural backgrounds. Based on a literature review Popov et al. (2012) have identified five main factors which play a role in working in heterogeneous student groups, namely 1) embracing members' knowledge, experiences and skills; 2) communication; 3) problem solving and decision making; 4) conflict management; and 5) leadership.

Firstly, embracing members' knowledge, experiences and skills refers to the management of differences within the group. The knowledge, experiences and skills which students bring to the group allows them to create something new by interacting across traditional disciplinary boundaries. Differences can benefit entrepreneurial outcomes by providing a wide range of prior knowledge and a rich source of entrepreneurial opportunities. In addition, students with no entrepreneurial experience or nascent entrepreneurial intentions can learn from those who already have an entrepreneurial background. If differences arise and are not managed adequately, however, they can lead to group problems, a lack of mutual understanding, decentralized thinking and divergence in the collaborative learning process and activities.

Secondly, the group communication factor refers to the reaching of "full comprehension among all group members, as well as to collect and disseminate necessary information related to the product of group work" (Popov et al. 2012:305). Communication challenges arise from mainly uneven levels of English

proficiency but also culturally conflicting communication styles (e.g. more direct versus indirect manners of communicating).

Thirdly, entrepreneurial projects are essentially about problem solving and decision making (Nickerson et al. 2004) in largely open-ended tasks of a substantial size and with considerable complexity (Nab et al. 2009). Within the collaborative learning group, individual problem-solving and decision-making styles can vary considerably across students and depend on their backgrounds, empathy and priority given to individual versus group goals (Popov et al. 2012). Students from different cultures can differ markedly in their perspectives on group work and their procedural knowledge, i.e. assumptions about how to collaborate and learn together (Cox et al. 1991).

Fourthly, conflict management is mentioned as an important factor for working in heterogeneous groups. Entrepreneurship is about taking risks, experimenting and pushing boundaries but at the same time working towards mutual goals and resilience – all of which can create tension and conflict. Further, from a diversity perspective, what is seen and felt as conflict can differ considerably among the members of a group. For some students, moreover, conflict may be a natural source for learning while for others conflict is an impediment and therefore something to be avoided at all times (Popov et al. 2012).

Finally, the last group of process factors which Popov and colleagues derived from the research literature concerns leadership. In group work, leadership refers to dealing with free riders, dominant group members and a lack of motivation among group members (Popov et al. 2012). What is expected of a leader and just how leaders deal with problems can also differ considerably from member to member of a group – particularly when the members have different backgrounds.

All of the aforementioned processes should finally lead to concrete *products*. From an individual learner perspective, the following EE outcomes have been identified as critical: knowledge of entrepreneurship (e.g. business economics), entrepreneurial behaviour and skills (e.g. proactive behaviour, entrepreneurial self-efficacy) and increased entrepreneurial intentions. More recently a multi-layer course of growth from interaction with the environment to the development of competencies and formation of beliefs to a final awareness of one's entrepreneurial identity and mission has been shown to be a typical EE outcome (Korthagen 2004, Mulder 2012, Oganisjana and Matlay 2012). The products of opportunity-centred learning at the level of the group can be a long list of local entrepreneurial ideas, selection of the most promising ideas with argumentation and the development of a preliminary business plan.

To summarize, the current literature on EE has drawn largely on the Theory of Planned Behaviour (Krueger et al. 2000). However, work carried out from this perspective reveals little about the learning processes underlying EE and how to reach the objectives of EE (e.g. opportunity-centred learning). The focus in the present study is therefore on those factors which stimulate learning in inter-disciplinary, culturally diverse groups, namely: 1) embracing members' knowledge,

experiences and skills; 2) communication; 3) problem solving and decision making; 4) conflict management; and 5) leadership (Popov et al. 2012).

3. Method

3.1. Study context (European summer school)

The summer school consisted of a 10-day intensive program in 2012, in which 35 professional and scientific bachelor students from the Netherlands, Latvia and Estonia participated. The students were studying in a variety disciplines: behavioural sciences, engineering and life sciences. The ESS and its implementation in actual practice were both designed to meet the requirements of opportunity-centred learning (Rae 2003).

Firstly, the students had to pass through all the stages of activity which characterize a real enterprise. Starting with group formation and idea generation and finalising the ideas they selected as products or services with a market demand together with the resources expected to be necessary in a business plan.

Secondly, traditional academic lecturing, which has been found to not activate students' entrepreneurship (Gibb 2002, Hannon et al. 2005, Heinonen and Poikkijoki 2006, Sogunro 2004), was avoided during the ESS. An interactive pedagogy was adopted instead, with the inclusion of active business people, creative workshops, case studies, company visits and group projects. Such an approach can be expected to enhance deep learning. It has also been argued that the best EE results are achieved when companies act as hosts for both students and teachers (Rae 2007) and when practising entrepreneurs and managers are integrated into university-level EE (Heinonen 2007, Wilson 2008). The participants in the summer school thus visited business incubators and companies to learn more about the challenges which entrepreneurs face and the ways in which they solve or attempt to solve these problems.

Thirdly, for the ESS, the students were divided into seven interdisciplinary, intercultural groups. Each group was facilitated by a teacher, and many of these teachers had their own businesses. This meant that the teachers were able to draw upon their own conceptual and theoretical knowledge but also upon their entrepreneurial experience when working with the students. These facilitators were always available to share their expertise when asked by members of the groups, but they did not impose their opinions on the groups. At the end of each day in the ESS, the groups shared their findings with the facilitators and were given feedback and guidance with regard to the next steps to be taken.

Fourthly, the overall atmosphere created during the ESS was open, friendly and flexible with professional facilitators providing support the students needed. The range of activities offered by the ESS, including the aforementioned company visits but also exploration of the city, field research and participation in cultural and social programmes outside the ESS provided plenty of space for collaboration. A crucial role was played by the hosting institution, which provided fully

equipped, modern education premises and a warm, welcoming atmosphere. The generally flexible and open atmosphere created for the ESS left plenty of room for unplanned activities which emerged from the learning situations and could thus be very relevant. For example, one of the students already had her own business and the other students wanted to learn from her experiences. This opportunity was thus provided.

Fifthly, all students were given opportunities to assess and analyse each group's achievements during the different stages of the project: 1) the initial screening of ideas 2) the selection of the final product or service for development; 3) drafting of the business plan; and 4) presentation of the final business plan. This created a combined spirit of group competition and group collaboration. The students were explicitly encouraged to share ideas, offer recommendations and be constructively critical of each other's intermediate results.

3.2. Design of the research and data analysis

Based on the theoretical perspectives and the stage of the project development, reflection questions were constructed for completion at the levels of the individual and the group. They were distributed on a daily basis via e-mail. For instance, the students might be asked the following:

- What did you manage/ not manage to do well?
- What did you like/dislike?
- What was/wasn't interesting?
- What do you consider especially valuable?
- What challenges did you face in the group work?
- How did you overcome the challenges you faced?

The responses to the reflection questions were then analysed and served two purposes. They helped us gain insight into the students' learning processes, their awareness of their progress and their awareness of the group's progress. They also provided essential daily feedback for the facilitating ESS teachers such that a new focus could be adopted or the focus of the group could be shifted as necessary.

The daily responses of the students to the reflection questions gave us more than 60 pages of student experiences to analyse. Qualitative content analyses (Mayring 2000) of the responses were conducted between January 2013 and May 2013. To identify those factors which played a role in the EE outcomes, a generic model of intercultural/interdisciplinary student group work (Popov et al. 2012) was called upon during the analyses. To reach mutual agreement on the categories which emerged from the data and guarantee the validity of the results, three researchers analysed the data independently to start with. Subsequently, all results were compared, discussed and integrated to develop an informative set of categories and identify what appear to be critical factors (Mayring 2000).

4. Results

In general, the results confirm the power of working in interdisciplinary, intercultural groups for entrepreneurial learning.

> *... the team is more important than the idea. When you don't have a good idea, you can think a new one up. Without a good team, you will not be flexible enough to think up a new idea. And without a good team, it will not work at all. I will use this when I perhaps start a company.* (st.7-2)

> *Cultures can be very different and awareness about that is important .... Our discussions are fun. We have different opinions. We also shared information about our countries: multicultural diversity.* (group 2)

More in detail, the students' reflections showed the importance of the factors identified by Popov et al. (2012) for working in groups.

4.1. Embracing knowledge, experiences and skills

With regard to embracing students' experiences, knowledge and skills, remarkable differences were observed within the groups. Some students already had considerable entrepreneurial experience while others had no such experience, and this could be seen to create tensions within the groups at times, particularly as the ESS was intended for students without a business background. When grouped with students with a business background, the education students – for instance – reported feeling low and intimidated by the entrepreneurially experienced members of the group who wanted, in turn, to move fast, became impatient and did not always try to understand the others in the group or show some understanding. As one student clearly phrased:

> *As I do not have a business background, I sometimes feel insecure about my role in the group, as other team members have advanced knowledge of business and economics. I feel more like a student, but not really a full member of the group, as there is little that I could contribute.* (st.5-1)

Differences in entrepreneurial experience were not *automatically* capitalized upon by the students and used as an opportunity to learn from each other although this did finally happen and the students themselves came to the conclusion that this should be done at the ESS. As one student remarked at the end:

> *... Because I did not have a background in that field, it helped me to have colleagues who did. It was really good that my colleagues already knew something .... I had this great opportunity to work with a group of people who already knew something about the field .... They taught us how to work on a business plan.* (st.1-1).

The analysis of the student responses to the reflection questions further showed the skills which were valued in the group work to be more generic entrepreneurial skills than domain-specific knowledge and skills. In particular, students mentioned the importance of creative thinking skills, seeking and seeing opportunities, social skills, presentation and argumentation skills, and an intention to put all of their

skills into entrepreneurial practice. Furthermore, the students pointed out the importance of such personal characteristics as being open to change, optimistic, flexible, enthusiastic and willing to put the acquired knowledge and skills into practice or at least attempt to do this.

> *... to have patience and to divide up tasks .... Time management is really important because our time is limited; do not worry if your English isn't very good; pay attention to team progress, the team work ... a little bit more flexibility.* (st.1-3)

> *... how important it is to go and ask for expertise when you are stuck, because that really helped me today. I will use this in my further life ... Flexibility, social competences like communication and you should also specialise yourself in something.* (st.7-5)

> *You should have fun, not be too serious, but sometimes work hard and be able to shout out when discussing with the team! ... independent, brave, ready for challenges. Willing to take risks, but still realistic and know when it is time to stop.* (st.7-3)

> *I realized even more than before that a negative attitude is not helpful at all. I learned that creativity can be quite fun* (st.5-3)

From a pedagogical, teaching perspective, the students emphasized the importance of having guided group activities before starting the project work. For instance, the students emphasised the importance of visiting companies together at the beginning of the programme.

> *... it was interesting to see the differences between* company A *and* company B *regarding the work atmosphere and employee treatment. This made me think about what I actually expect of my own workplace and what kind of atmosphere I would like to work together in with others.* (st.6-3).

> *From* company B*, I learnt that first impressions are really important – in order to become successful, you need to make a product that makes a good first impression. It is important to have some innovation from time to time.* (st.6-1)

However, the companies should be comprehensible for everyone. Not everyone was able to directly relate to multinationals or very competitive, aggressive companies.

> *We realized that the group members had totally different expectations and experiences during the company visits. Opinions about the visits differed, partly because of personal preferences, cultural and background differences and educational focus* (group 3).

Related to product comprehensibility, the next important insight provided by the students' responses to the reflection questions concerned preparation of both the students and the companies before visiting them. Given that many of the students did not have clear ideas about entrepreneurship or a focus for their own entrepreneurship yet, they found it difficult to ask questions and request relevant information.

> *As we had very little information about our project at the time, we had difficulties preparing questions for the company visits. We did not know what we might get out of the visits. What was the intended value of the visits? .... We nevertheless saw that teamwork, attitude, motivation, prestige and project management are really important.* (group 3)

The importance of entrepreneurs sharing their experiences with students also stood out in the responses of the students to the reflection questions.

> *When we visited the business incubator, I learned a lot more about the process of starting a business – also from meeting people who had been part of the business incubator, who shared their own start-up experiences. As there is still a lot I need to learn about business, I do not know which of the ideas might become useful yet.* (st.5-1)

4.2. Communication

The second factor identified by Popov et al. (2012), namely communication, was mentioned by the students as well. Students referred to the importance of cultural awareness and being able as a group to overcome language, cultural and education barriers. The students also mentioned the importance of listening, sharing ideas, inspiring each other, having positive group spirit and achieving mutual goals. Openness, tolerance and patience were further mentioned as important.

> *... it is more helpful to talk even when you do not say everything correctly, because I learn from mistakes I make....* (st.7-2)

> *Choosing an idea is difficult but with a good communication we are able to overcome those difficulties.* (group 4)

> *I could say I learned to be more patient, to be a better listener, to communicate my thoughts in a creative and maybe also more clear and organised way. I learned that my thoughts may be worth listening to even if I have less background on the topic.* (st.3-2)

> *I have already learned new things about Latvians and Dutch by communicating with them. I have learned things about their language, personalities and culture.* (st.2-4)

4.3. Problem solving and decision making

While working on their projects, the students came across many problems and thus the third factor identified by Popov et al. (2012). These were problems which the students in the groups had to address both individually and as a team. While their problem solving required them to see the "bigger picture" and thus keep the context of the overall business concept or model in mind, this was unfortunately not always possible because it required an understanding of market information, societal issues, supply-demand principles and marketing channels as well as the needs, problems and pains of potential customers.

> *We have understood that it is very hard to work on a project that requires a lot of research and work, especially when the team mates are from different fields of expertise and the communication is sometimes hindered.* (group 5)
>
> *Everyone has their own expertise and their own way of approaching a problem.*(group 4)
>
> *I liked getting an idea of the "concrete" form of a business plan. To be honest, I did not really know what should be in there before. Furthermore, I like that entrepreneurship is an on-going process about problem solving: you always try to see opportunities when a problem pops up. I like this way of "reframing" problems.* (st.3-3)
>
> *Teamwork is essential for the outcome. Language and cultural barriers can be a problem for research. Don't try to change the person, use his best qualities.* (st.3-2)

Meta-knowledge about the problem solving process and awareness of problem solving strategies seem to be key here.

> *Different people (probably depending on culture in my opinion) have different strategies and views on problem solving. When working together with people from different countries, I noticed that priorities were set differently. This could create friction, but also open new windows.* (st.3-3)

Moving from the opportunity identification phase to the exploitation phase of opportunity-centred learning (Rae 2003) meant a substantial shift in the decision-making logic of the students. The identification phase – which is characterized by experimentation, creativity, play and discovery – was abruptly replaced by refinement of ideas, production considerations, efficiency, selection and implementation. During the exploitation stage, the students had to make decisions, distribute tasks and manage their time effectively. The shift from the first to the second phase opportunity-centred learning was experienced by the students as difficult, but important.

> *I liked thinking of a business plan from the client's point of view, what they can get out of it. By thinking and talking about it like that, I understood the main point and necessity of our product even more.* (st.2-4)
>
> *We think more in detail about our project now. It is another point of view, we now rethink everything. It offers more structure. It became more real. Better understanding of the feasibility of the project.* (group 2)
>
> *I think that during the next days, after talking to our potential customers, we will have to make many changes to our first ideas.* (st.7-2)
>
> *I liked getting through the difficulties we had to make the process and the business idea itself better. It helped to see how a business idea needs to be elaborated and what different things need to be considered and come up.*(st.3-1)

4.4. Conflict management

As the ESS progressed, some groups had to face internal conflicts, the fourth factor described by Popov et al. (2012). In order to effectively deal with such

conflicts, students indicated the importance of identifying problems at an early stage. The key to solving group conflicts, in their opinion, is to identify and realize collective goals through communication.

> *I learned that a clear and fully-defined aim is vital. I will remember this in even the most mundane activities.* (st.2-2)
>
> *I liked the part when we finally made a decision together. It was usually worth arguing about.* (st.7-5)

Furthermore, the prevention and solution of internal conflicts requires team discipline, shared rules and roles, and also team participation and input from all members of the group. From an individual perspective, this requires listening and being open, acknowledging different opinions, coping with insecurities and staying positive.

4.5. Leadership

Finally, leadership or the fifth factor mentioned by Popov et al. (2012) was mostly perceived as the necessity of having *entrepreneurial* leaders. Such group leaders were perceived to engage others, recognize opportunities, dare to take risks and detect failures before other members of the group might do this.

> *It is hard to motivate people and especially in such a short period of time.* (st.7-3)
>
> *In a group, I really need someone to be a leader, both to exploit my idea-generating personality but also prevent me from mixing things up and doing everything at the same time (prevent me from getting distracted) – a group leader who needs to be stimulating at the same time.* (st.5-2)
>
> *I know my weaknesses, so I can tell that I am more of a team player than a leader. I suppose that it is important to be a leader and have strong communication skills and an ability to convince people, which I am not always good at.* (st.3-1)

5. Discussion

The research question posed in the introduction was: *What factors are perceived by students to contribute to entrepreneurial learning within interdisciplinary, intercultural student groups?* The results showed that all diversity factors as described by Popov et al. (2012) for group work were also highly relevant in the interdisciplinary, intercultural summer school context of the present study. Nonetheless, the general factors described by Popov and colleagues also showed dynamics which appeared to be specific to the context of EE. Particularly the factors embracing members' knowledge, experiences and skills, problem solving and decision making and leadership showed this context-specificity and are therefore discussed in the following.

Firstly, from the perspective of embracing the knowledge, experiences and skills of the different members of the group, the groups of students participating in

the ESS can theoretically draw upon three valuable sources for entrepreneurial ideas: the diversity in the prior entrepreneurial experiences of the members of the group, the national/cultural diversity of the group members (e.g. how problems are solved in other countries) and the disciplinary diversity of the group (e.g. adoption of different angles to explore an entrepreneurial opportunity and the creation of something new by crossing traditional disciplinary boundaries). However, our results show that having at least some entrepreneurial experience was valued most in the groups and therefore regarded as most important. The national/cultural and disciplinary diversity within the groups were often not recognized by the groups as an asset for the identification and generation of entrepreneurial ideas. Tapping into group diversity may thus require more effort on the part of group facilitators, who can – for example – help students make what they as an individual can contribute to an entrepreneurial idea more explicit. In other words, helping students to develop a "professional" language for the sharing of each other's ideas and thus creating a common ground. Gaining insight into the backgrounds of the students in a group right from the beginning can help establish a high-performing group – a group which capitalises on its diversity rather than being constrained by it (McCorkle et al. 1999). Special attention must be paid to several background variables in particular: prior domain knowledge, prior experiences with group work, prior entrepreneurial experience and mastery of the specific skills needed to perform the task at hand. Company visits can help in this regard, provided that these visits address the importance of all three sources of entrepreneurial opportunities (i.e. entrepreneurial, disciplinary and cultural diversity) and that the students are able to connect their backgrounds to what they see at the companies (i.e. scaffolding company visits).

Secondly, joint problem solving and decision making posed one of the major challenges in the intercultural group work as observed by Popov et al. (2012). The combination of the problem solving and decision making required by entrepreneurial projects together with the challenges of working in a nationally/culturally diverse setting, require groups to find workable methods to proceed. If this takes too much time or occurs with too much conflict, the group outcome is seriously threatened. And in a number of studies, the group dynamics in culturally diverse groups have been shown to differ to a large extent from those in same-culture groups (see Williams and O'Reilly 1998). Culturally diverse groups often suffer from process losses precisely because of misunderstandings and coordination difficulties, and this has been found to be the case especially when the students do not know each other and must collaborate together for the first time (Anderson and Hiltz 2001). Students working in culturally diverse environments may not overcome the challenges of group work to achieve the potential rewards of such collaboration, thus, without additional facilitation. Effective entrepreneurial problem-solving and decision-making require more than minimal guidance from EE teachers; they require active facilitation. Given that the business opportunities of tomorrow (like in the field of sustainability, see Lans et al. 2013) are often 'wicked problems' or, in other words, problems which are difficult to

pin down, new pedagogical tools are needed to help students develop the skills needed to tackle such problems. For example, implementation of the eight stages which have been identified for the creative problem-solving process could be stimulated (see Sawyer 2012). Teachers/facilitators should make groups aware of the importance of the problem-solving process and the problem-solving strategies adopted within the group and give clear suggestions for addressing them in their group (see Popov et al. in press).

Thirdly, entrepreneurial leadership is always needed at some point. This type of leadership involves more than simply having a group leader who effectively deals with free riders, dominance or lack of motivation (Popov et al. 2012); entrepreneurial leadership requires someone who is engaging, is proactive, is willing to take risks, has the achievement motivation to really pursue ideas with passion. Watching for such inspiring individuals while forming groups thus appears to be the key here for facilitators.

Finally, some possible limitations on the present study should be addressed at this point. The length of the study period allowed only short-term learning experiences. The development of effective team dynamics and teamwork requires time, however. In future studies, moreover, greater attention should be paid to influences of specific pedagogical interventions themselves (e.g. informed company visits, aligned proactive group facilitation, etc.). In addition, not only the reflections of students but also the reflections of their facilitators should be analysed during such a ESS.

This allows corrective measures to be identified at an early stage and subsequent interventions to be applied. This is of great importance in intense and short-term courses as investigated in this study. Future research would benefit from teacher reflections on such interventions during the learning processes.

6. Conclusion

To conclude, we started this article with the observation that the number of EE programmes is rapidly growing in Europe but that there is room for improvement. Research on EE is nevertheless still young. At present, most of the empirical work on EE is carried out from the perspective of stimulating entrepreneurial intentions. Only limited empirical research has been conducted on the entrepreneurial learning of higher education students. The present research helped fill this gap by exploring the learning of 35 non-business students who participated in an intensive, intercultural, interdisciplinary, entrepreneurial summer school. The results showed heterogeneity in the form of disciplinary and cultural differences within student groups to contribute to their learning in general and their opportunity-centred learning in particular but also give rise to considerable confusion and misunderstandings within the entrepreneurial education context. The present results can help researchers, teachers and facilitators to better understand the entrepreneurial student learning process and influence of working on international, interdisciplinary

projects. And with this improved understanding, a start can be made on the development of effective EE for higher education students.

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SUPERVISORS' CONCEPTIONS OF DOCTORAL STUDIES

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Abstract. Changes in the content and organization of doctoral studies have provided material for researching different aspects of doctoral studies. Much of the current literature concentrates on identifying the functions that an effective supervisor needs to carry out. Less attention has been paid to how well supervisors understand the aims of doctoral studies. The aim of this study was to describe the Estonian PhD supervisors' conceptions about doctoral studies. The study is based on semi-structured interviews with 21 PhD supervisors from educational science and exact and natural science disciplines. The data was analyzed using qualitative thematic data analysis techniques. The results show that according to supervisors' conceptions, the aim of a doctoral study is to prepare future researchers and acquire academic writing skills as quickly as possible. Doctoral studies are also seen as an intermediate process in the course of becoming a researcher.

Keywords: doctoral education, supervisors' conceptions, qualitative research, Estonia

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1. Introduction

A recent study of doctoral students (Vassil and Solvak 2012) showed alarming results regarding the doctoral education in Estonia. Sixty per cent of PhD students fail to graduate on time or drop out from doctoral programmes. The pressure to complete successful doctoral work on time is increasingly important in Estonia (Kärner 2009, Vassil and Solvak 2012) as well as in other countries (see e.g. Kehm 2004).

The successful completion of a PhD depends on several factors. McCormack (2005) pointed out four categories: the psychological features of the doctoral student, the socio-economic situation of the student, the discipline and type of research, and supervision. Although all of the above mentioned factors are important, several scholars (e.g. Halse and Malfroy 2010, Lee 2008) have claimed that the supervisor is still considered to be the main instigator of a PhD student's

learning process. The scope of the current study is PhD supervision and supervisors' conceptions. Addressing the views of supervisors is important as the awareness of conceptual approaches to supervision has been seen as the main influencer and prerequisite for successful supervision (Lee 2008). As empirical studies on the conceptions of supervisors are limited in number (the research necessity has also been expressed by Brew (2001), Kiley and Mullins (2005), and Lee (2008)), and it is not clear which views underlie supervisory practices in the Estonian context (Kärner 2009), it is relevant to tackle the matter further through empirical research.

The current study was a part of a larger study that aimed at describing and analysing the supervisory practices of PhD supervisors as well as the factors that influence these (see e.g. Lepp, Karm and Remmik 2013). This paper focused on Estonian supervisors' conceptions of doctoral studies, with accentuated focus on supervisors' conceptions of the output of doctoral studies and the learning of PhD students during doctoral studies. The term "conceptions" in this paper is used similarly to Kiley and Mullins (2005) according to which it refers to a PhD supervisor's understanding of what the aims of doctoral studies and doctoral dissertations are.

In the empirical part of the study, the focus was on the conceptions of supervisors from two domains (educational science and exact and natural sciences). The article presents an overview of the literature discussing how earlier studies have described the learning of PhD students and the aims of doctoral studies in general, outlines the findings of the study, and discusses some implications for doctoral education.

1.1. The aim of doctoral studies

Gaining a PhD can be viewed as a unique and highly personal experience, during which the development of the doctoral student occurs. The relevant literature (see e.g. Doctoral studies in … 2007, Kärner and Puura 2008, McAlpine and Norton 2006) is gradually laying more emphasis on the fact that the aim of PhD studies is not only preparing new researchers. Therefore, as stated by Mowbray and Halse (2010:662) "it shifts the lens from the instrumental production of the skilled PhD graduate to the progressive building of virtuous individuals who contribute to society through their productive actions". Doctoral studies as the frontier research in all disciplines is thus seen as a major source of innovation in a knowledge-based society and has a crucial role to play in the development of economic, political, and cultural life (Doctoral studies in … 2007).

Mowbray and Halse (2010:657–660) described the purpose of a PhD and reflected on what it develops, distinguishing three major areas: 1) developing personal resourcefulness that "enables students to become more assertive, confident, resilient, persistent and resolute in determining how to progress their PhD while balancing their other commitments"; 2) developing cognition, where the focal point is the development of critical thinking skills; and 3) developing research and other skills – data analysis, computer skills, management skills.

Consequently, PhD studies constitute a period during which students not only acquire direct research skills but also, as stated by Mullins and Kiley (2000:4) "amongst other things a student learns the art and the science of research."

An emerging theme in doctoral discourse is the topic of PhD as a Process and PhD as a Product (Park 2005). In case of PhD as a Product, the main tangible product is the dissertation that each student must present. In case of PhD as a Process, the switch from content to competence is valued, and the PhD experience as a whole is considered important.

Furthermore, research on supervisors' conceptions reflects that the focus of the supervisor during supervision is directed either at the product or the process. For example, having researched supervisors' conceptions, Emilsson and Johnsson (2007) and Murphy et al. (2007) found that supervision focus at one extreme is on the task (task-focused beliefs) and at the other on interpersonal processes and relationships (person-focused beliefs). With focus on task, supervision is concentrated on the immediate implementation of research tasks and skill development through those tasks. In the context of interpersonal processes, and person-focused beliefs, supervisors are more broadly concerned with the candidate's development as a person in general.

Moreover, Lee (2008) in her study of PhD supervisors demonstrated that there are different approaches to supervision (which are usually combined in the supervision process).

1) Functional, characterized by a clear focus on the task. Therefore, the functional approach sits most closely with the professional role of the researcher and can be related to the abovementioned focus of PhD as a Product. 2) *Enculturation*, where achieving a PhD is about becoming a member of a community. 3) *Critical thinking*, where the analytical thinking of a student is valued and according to Lee (2008), conventionally, this is the heart of the PhD supervision. 4) *Emancipation,* (similar to Brew's (2001) journey conception and leaning towards PhD as a Process) where the supervisor considers the personal growth of a student to be significant, and 5) *relationship development*, which places emphasis on working in and as part of a group.

On the one hand, supervisors in their supervisory practices are influenced by their views on doctoral studies and its aims in general (see e.g. Brew 2001, Lee 2008). On the other hand, a pertinent aim of PhD studies is finalising a dissertation which needs to meet the required standards on which the student and the supervisor act.

It is clearly stated that a doctoral dissertation can be regarded as a 'product' providing new and original knowledge. As stated in the League of European Research Universities document, "doctoral theses are expected to give a substantive and original contribution, in either content or method, to the candidate's study field" (Doctoral studies in …2007). Green and Bowden (2012) were inclined to think that a doctoral student has to find new explanations, evidence of a different way of seeing something from what has been seen before, or develop a new theory that would replace or 'oust' an existing one. By doing so, the student

would learn to see their own perspective as one among many, and similarly, the perspectives of others. In the end, students would be able to trust and prove their own perspective, even when it is in contrast to other approaches.

Due to the changes that are taking place in higher education (e.g. Bologna reform, and consequently, doctoral students' highly varied educational backgrounds; reduced resources (see Kehm 2004)), questions have been raised whether the requirements for dissertations can be met within the parameters of a PhD (Craswell 2007) – whether accomplishing the stated aims (e.g. originality) is realistic given the limited resources (e.g. time, previous knowledge of students, finances). There have also been doubts about the quality of doctoral dissertations. For instance, Park (2005:198) noted that over recent decades, the traditional notion of "a piece of research that could have a lasting impact on a discipline" has been replaced by the more pragmatic notion of a manageable piece of work, of a scope and size that a student reasonably expects to complete within the nominal study period.

Therefore, summarising theoretical considerations, it could be said that the learning of PhD students during doctoral studies takes place in different aspects whereas the supervisors' conceptions regarding PhD as a Product or PhD as a Process are of importance, determining whether the focus is on the task or on the person or which approach to supervision is 'the dominant approach'. Moreover, the finalization of a dissertation as an end-product is directed by different regulations and requirements, which the supervisor needs to consider.

1.2. Research task

Drawing on the above presented theoretical framework, the aim of this study was to describe Estonian PhD supervisors' conceptions about doctoral studies. More specifically, we formulated three research questions: 1) what conceptions of the aim of doctoral studies do PhD supervisors hold?, 2) what do supervisors presume a doctoral student should learn and how students should change during doctoral studies?, 3) what conceptions of the aim of doctoral dissertation do PhD supervisors hold?

2. Method

2.1. Participants

The study was based on semi-structured interviews with 21 supervisors (15 in educational sciences, including 3 in the domain of science education, and 6 in exact and natural sciences) in two research-intensive Estonian universities. All participants (11 male, 10 female) were senior academics, with the majority being professors or associate professors. Participants ranged from being inexperienced in doctoral supervision (i.e. no doctoral completions yet) to very experienced (i.e. 10 or more completions).

Selection of the sample from two different domains was motivated by the difference in the doctoral students' graduation rates and progress in their studies. The PhD students of educational sciences progress in their studies slower than the students of exact and natural sciences (see Ots, Leijen and Pedaste 2012) and merely 30 per cent of educational science PhD students graduate within the nominal period in Estonia. Furthermore, the level of on-time graduation for the curricula of Biosciences and Environment is between 70 to 83 per cent (see Doktoriõppe üleminekuhindamine. Bio-… 2011). Based on doctoral completion rates, it could be assumed that there are substantial differences in the organization and arrangements of doctoral studies in these domains. The differences could become evident in the conceptions of supervisors from the two domains.

2.2. Data collection and analysis

The data was collected using semi-structured interviews (see Appendix). All interviews consisted of questions seeking information concerning the aim of doctoral studies and doctoral dissertation (e.g. what they thought the aim of a doctoral dissertation was), and participants were asked to share their understandings about what a doctoral student should learn and how they should change during doctoral studies (e.g. what do you think a doctoral student should learn during the studies?). Questions asked in a similar manner (e.g. what do you think research is?) have also been used by Kiley and Mullins (2005) to study the conceptions of supervisors. These initial questions were followed by additional clarifying questions (e.g. can you expand a little on this?). Throughout the process of constructing interview questions, many potential interview questions were examined, discussed with academic colleagues, and tried out in the target group.

All the interviews were fully transcribed. To protect the participants' identities, supervisors and people mentioned in the interviews were given pseudonyms.

The data was analysed using qualitative thematic data analysis techniques. The thematic analysis (Ryan and Bernard 2003) consisted of discovering themes and sub-themes, deciding which themes are important in this research area, and building hierarchies of themes. Three authors undertook parallel coding to ensure consistency in the interpretation of the transcribed text. If there was a disagreement about coding or categorization, authors went back to the original data and discussed it until a consensus was reached. A random member-check was used to increase the credibility of the findings.

It should be pointed out that the intension at this stage of research was to identify a variety of concepts of doctoral studies held by supervisors. When the concepts were clearly domain-bound in the supervisors' descriptions, the differences were shown separately in the results. The presented results follow the identified themes and sub-themes.

3. Results

3.1. The aims of doctoral studies

Three main categories emerged in the supervisors' interviews when talking about the aims of doctoral studies: 1) doctoral studies as a way of educating future researchers and developing the domain, 2) doctoral studies as a way of creating new knowledge, 3) doctoral studies as a PhD student's learning process.

3.1.1. Doctoral studies as a way of educating future researchers and developing the domain

According to supervisors' conceptions, the aim of doctoral studies was educating future researchers and thus developing the domain in general. While discussing students' professional careers, a doctoral studies graduate was predominantly seen as an independent researcher being a member or leader of a research group involved in developing the domain further.

> *I would like to see it as rearing offspring, that grants would form of the candidates in the next few years, that some kind of smaller research groups would form.* (Anne)

In supervisors' conceptions, the topic of domain development was closely bound up with the dimensions of local practice development and internationality. The supervisors in the exact and natural sciences clearly emphasized contributing to science undertaken internationally. Several supervisors in educational sciences considered the international dimension to be important as well, especially when it came to the distribution and value of research results (e.g. articles must be published and dissertation presented in English in order to communicate it to international audiences). Some supervisors in the educational domain stressed the idea that science must predominantly serve national interests and solve the problems of the Estonian education sphere. The supervisors expressed their concern of students' studies not always being planned while taking the needs and issues of the Estonian educational sphere into consideration as the applicability and implementation of the results is poor.

According to the supervisors, the output of doctoral studies could be significantly broader: in addition to educating future academics, doctoral studies could also prepare people for working in leading positions in either the private sector or public institutions. Nevertheless, it was mentioned that although a broader output is necessary, since the doctoral completion rate is low, the graduates were primarily 'necessary' for the university itself.

> *Not everyone having been conferred a PhD has to start working in the academic sphere. Unfortunately, we get so few graduates and the offspring is so limited that mostly they do stay/.../Our society would benefit so much from having people with PhD degrees working only in the Ministry of Education and Research, not to mention other spheres.* (Mary)

Supervisors often referred to doctoral studies as an intermediate step in the process of becoming a credible researcher. The supervisors were of the view that doctoral studies were mainly a formal intermediate step after which the skills and knowledge were still being gained and built on in future research.

> *Well, for me, a doctoral degree is really a formal parameter/.../it is one point on a continuous scale./.../Simply, a natural course of events brings to a point where a doctoral degree is received and then research is continued.* (Arvo)

3.1.2. Doctoral studies as a way of creating new knowledge

The supervisors had a common view that by the end of doctoral studies, new knowledge should have been acquired or be established in a particular domain, or a novel dimension added to the existing knowledge base as a result of the undertaken research during doctoral studies. New knowledge could be created, according to the supervisors' conceptions, by tackling an issue within a research group as well as individually (on the topic selected by the student). The supervisors from the educational domain expressed their understanding that working individually made researching time-consuming.

> *You work on your research when you have the time/.../You move on as you can and we don't have any greater projects, so we basically operate on non-existent finances, only relying on our brain potential.* (Sandra)

Nevertheless, supervisors of the educational sphere valued the aspirations of PhD students to give added value to science and solve the problems rising from practice by independent research.

> *To my mind, the best developers come from practice, they can see what the problem is.* (Karla)

3.1.3. Doctoral studies as a PhD student's learning process

In supervisors' conceptions, the development and learning of a PhD student during doctoral studies occurred in two directions: 1) doctoral studies as the acquisition of skills, and 2) doctoral studies as the development of a person.

3.1.3.1. Doctoral studies as the acquisition of skills

The supervisors stated that the acquisition of a PhD student's research skills occurred both through passing compulsory subjects and doing practical research activities. Participants considered the subjects of doctoral studies necessary. Nonetheless, some supervisors were concerned that students took the subjects, but that the transfer of learned material was complicated.

> *They are awfully enthusiastic about the courses they take, they proudly talk about it and when I ask how their own thesis is coming along, they can't give me any answer./.../They take the course, learn the thing, do some practical tasks and when they need to do the same in their own work, nothing!* (Vambola)

The supervisors stated that the creation of scientific text was one of the most important skills students needed to acquire during their doctoral studies. It was understood that writing articles required practice; however, supervisors understood their roles differently: the supervisor as a co-author (writing together) or as a reviewer (giving feedback). In supervisors' conceptions, the acquisition of scientific writing skills was closely tied to the pressure to complete doctoral studies within the nominal study period.

> *We start writing articles from the start, we try to write these 3 articles together /.../ Even if his or her [the supervisor] role in writing the article has been bigger than that of the supervisee, he or she still puts them [students in the list of authors] first.* (Riina)

When discussing the transferable skills acquired during doctoral studies, the supervisors pointed out critical thinking and cooperation skills as well as the development of independence. According to supervisors, on the one hand, critical thinking skills stood for a doubtful attitude concerning theoretical standpoints and the opinions of the supervisor. On the other hand, critical thinking for supervisors represented the confidence of the student to express their viewpoints in a reasoned manner, both verbally and in writing, during their studies. An important resource in the formation of critical thinking skills was considered to be the literature of the field; thus, a student should be guided towards purposeful reading in the first year.

> *You need to doubt constantly, you need to be critical, you need to ask questions /.../ You have to doubt previous results, but for that you need to read similar things, research, theory and then you have to ask whether it is the way they say it is.* (Karoliina)

The supervisors regarded the increase in students' independence in the course of doctoral studies to be important. Moreover, during their studies, a doctoral student should become an independent researcher capable of initiating ideas, planning, analyzing, writing, and expressing their views in their domain.

> *I've told my students that I presume a doctoral student is a person who can work independently for a week without me having to stand next to them.* (Heldur)

The supervisors expressed their view that a student as a future researcher had to acquire cooperation skills and become a member of the research community. It was stated that students should have understood how conducting research cooperatively and making use of discussions (in research groups, as well as taking part in conferences and making use of other ways of communication) created opportunities for conducting research together with supportive colleagues to be able to work in research groups after their doctoral studies had been completed.

> *Science is not done alone. The biggest qualitative change in a person is that they become a member of the academic community and are able to communicate there.* (Anne)

3.1.3.2. Doctoral studies as a PhD student's personal development

According to supervisors' conceptions, the development of a person as a whole should occur during doctoral studies. The interviewees mentioned it in relation to broadening one's horizons that happened through passing subjects of doctoral studies, attending conferences abroad as well as reading independently and having discussions with the supervisor. Several supervisors perceived their role in it as helpers with foreign trips, communication partners, and advisors.

> *For me it's important that a person would not only mature as a researcher, but also as a person/.../I discuss culture and books with students, send them abroad and recommend places to visit/.../I want them to be educated people with a broad worldview.* (Kristjan)

There were several supervisors who considered the development of a person to be important, but to support it was not considered the task of a supervisor.

3.2. Views of doctoral dissertation

The supervisors of a particular study considered a doctoral dissertation to be research work which should thus meet all the requirements. According to their descriptions, the foundation of research was applying scientific method and scientific argumentation ("the whole working culture is scientific" (Toomas)) – obtaining trustworthy data and providing a scientifically valid answer to the problem raised.

Most supervisors participating in the study expressed their view that PhD dissertations were research work of quality and international value.

> *We don't have PhD student research, we have just research/.../The student works with us and carries out research on the same level as us [other members of the research group in the lab].* (Uku)

At the same time, there were doubts expressed in the interviews concerning the conformity of some of the defended dissertations to the content-related requirements of research work, and these non-conformities occurred, according to supervisors, at both universities to whom the supervisors belonged to in the sample.

> *The quality of dissertations is very inconsistent/.../namely, there are theses that are on a very good international level and there are those that, well, practically revise some other work with a small supplementary aspect.* (Eero)

The supervisors also discussed whether and to which extent the format of a dissertation (a monograph or an article-based dissertation) enabled to reflect the aim of the dissertation. The supervisors of exact and natural sciences domain expressed an understanding that article-based dissertations were suitable for the domain. Several supervisors of educational sciences doubted whether an article-based dissertation ensured providing a wide and thorough overview of the field the way writing a monograph did.

> *I haven't seen one article-based dissertation where a person has conducted one study from beginning to end/.../You get some data, write an article together with*

> *your supervisor/…/there is no study process experience because you are dealing with secondary data, and personal learning experience is lost/…/We are only dealing with creating articles. I think learning as such remains partial.* (Karoliina)

According to supervisors, it was important for the dissertation to either be written on the basis of one study or be a whole solving one particular research problem. The principle of integrity was considered important by supervisors from both domains.

> *Well, article-based dissertations have their own issues. In the sense that they are often articles of different areas that have been put together and sort of a summary is created/…/Yes, the person has published their four or five articles but they are co-authored, about different things and they haven't been able to squeeze it into one/…/You can do either well and poorly. And it is unfortunate if either is done poorly and it is good if either is done well./…/I personally find a dissertation should be decent, no matter the format.* (Uno)

When discussing the completion of doctoral studies, the dimension of time was expressed in supervisors' conceptions. It was mentioned that getting articles published was difficult, mainly because according to supervisors doctoral students found it challenging to compete with the publications of professors, who have more expertise and experience in writing for journals. The fact that the length of the publication process may cause a delay in the graduation date was mentioned by the supervisors. In fact, supervisors of the exact and natural sciences domain differed by saying that getting published was time-consuming; however, this was not usually a problem as writing collaboratively in research groups made publishing possible already at the beginning of doctoral studies.

The supervisors consented that there was a need both for clear agreements concerning the quality of dissertations as well as specifications of general requirements – there was a need for general standards of doctoral studies across the sector. Supervisors also expressed their wish to consider the quality of PhD dissertations within their own universities. When discussing it, supervisors emphasized that reaching such agreements was necessary for creating equal conditions for the students. At the same time, it was considered necessary from the viewpoint of supervisors' own supervisory practices.

> *During the defence, supervisors gain and adjust their understandings of what a dissertation should be like.* (Karla)

4. Discussion

Findings concerning educating future academics as one aim of the doctoral study were in line with earlier research and with the official documents on doctoral studies in Estonia (see e.g. Kärner and Puura 2008, Teaduskraadide põhimäärus 2012). Moreover, emphasis on a wider focus of doctoral studies was consistent with international research (Boud and Tennant 2006, McAlpine and Norton 2006).

However, supervisors' conceptions on the output of doctoral studies were somewhat controversial: although supervisors stressed the need for people with a PhD degree in other sectors; in their conceptions, they focused solely on educating future academics, valuing an academic career. This raises a question concerning the extent to which a supervisor focusing only on academic career would be able to meet multiple aims of doctoral education.

Supervisors' conceptions were also controversial regarding the scientific and practical relevance of doctoral studies. Supervisors were of the opinion that research results should add new knowledge to the domain internationally; at the same time, national interests were considered pertinent. Achieving both practical and theoretical relevance in a doctoral dissertation is complicated, and thus developing the educational sphere of Estonia as a small country, while adding new theoretical knowledge to the research of the world (and vice versa), may prove to be challenging. A potential solution to the issues discussed above would be working out and implementing the Professional doctorate model in the framework of doctoral study (see e.g. Boud and Tennant 2006, Kehm 2004), which would cater for the universities' need to educate future academics as well as deal with practice-bound domains based on research.

The results indicated that according to supervisors' conceptions, doctoral study was an intermediate step in the process of becoming a credible researcher, which was consistent with the approach of PhD as a Process (see Park 2007) and the findings of Mullins and Kiley (2002:386), according to which "A PhD is a stepping stone into a researcher's career/…/A PhD is three years of solid work, not a Nobel Prize". Consequently, on the one hand, supervisors regarded the doctoral study as an 'intermediate step' and a doctoral student was seen as a learner being supported in writing articles and getting published. On the other hand, supervisors had a conception that the dissertation finalised in the course of the doctoral study was research work which added novel knowledge and was also of international value. A significant theme in supervisors' conceptions was writing articles suitable for publication. As supervisors comprehended that in the process of getting published, the article of the student competed with the ones of experienced professors, they contributed to writing articles and publishing the results more than would strictly be necessary or sensible from the aspect of student's learning process. Therefore, the expectations supervisors and the society as a whole have of the content of dissertations should be considered. Namely, whether the end result should merely be a product with all parts meeting high academic standards, or whether a dissertation can clearly reflect on the development of the student as a researcher. A thought-provoking question would thus be: what is being assessed when the quality of a dissertation is under question – student's development and forming into an independent researcher, or the end-product that may have a vague personal contribution by the student (as it is shared with the supervisors and a research group)?

When discussing dissertations as products, earlier studies have described the tendency to specify and standardize general requirements of dissertations

(Doctoral studies in… 2007, Kehm 2004). The current study also demonstrated that supervisors considered general standards within universities as well as across sectors to be important. Consequently, a point worth considering is the extent to which the supervisors' understandings (as well as supervisors as members of the defence committee) concerning the quality of dissertations overlap. Another aspect to consider would be the consistency of requirements to dissertations with what is being assessed. Similarly to the study of Mullins and Kiley (2002), the supervisors of the current study regarded such knowledge to be essential for themselves as supervisors as well as for their PhD students. Although the supervisors expressed a view that concise and uniformly followed requirements of doctoral dissertations would be necessary, can an excessive effort to standardize the requirements lead to situations where people may operate within limited paradigms or use limited range of methodologies?

Based on the conceptions of supervisors participating in the study, both progressing fixedly towards a dissertation as an end result (focus on task and PhD as a Product) and becoming a member of the academic community in addition to developing as a person (focus on person and PhD as a Process) were considered important, similarly to the studies of Emilsson and Johnsson (2007) and Murphy et al. (2004). With regard to the learning of students, all characteristic features of approaches described by Lee (2008) were evident in supervisors' conceptions; thus, the conceptions of supervisors were multifaceted. Functional approach and critical thinking were mostly mentioned in connection with emphasizing a student acquiring writing skills, whereas in supervisors' conceptions they were expressed combined with the approach of emancipation and enculturation. The acquisition of skills necessary for working in a team, also emphasized by the supervisors, overlapped with Lee's (2008) relationship development approach. Therefore, based on supervisors' conceptions, it was important to support the development of a PhD student as a researcher in different aspects, which is in accordance with approaches presented in earlier studies (e.g. Brew 2001, Lee 2008). Further research would be needed to determine to which extent differences in the conceptions expressed by the supervisors and their actual supervisory practices occur.

Although the results of the current study do not provide a definite answer as to how and in which areas supervisors should be supported, it is still relevant to carry on construing how to diversify supervisors' conceptions of the output of doctoral studies and supporting the learning of the student so that this diversity in supervisors' conceptions would also be expressed in their actual supervisory practices.

The authors of the study consider it necessary to stress that the given results were initial categories of conceptions and further analysis by increasing the sample as well as standardizing the proportional distribution is necessary. Although a disproportionate and small-scale sample hindered making generalizations, some observations among the supervisors participating in the study could be made. Namely, the conceptions of supervisors in educational science domain held greater variety than those of supervisors in the exact and natural sciences domain. More-

over, supervisors of science education domain were in their conceptions more similar to the supervisors from the exact and natural sciences domain. Disciplinary differences in supervisors' conceptions are worth investigating further. A *phenomenographic* data analysis would be a helpful addition to this work.

Kiley and Mullins (2005:260) have stated that "it is argued that unless the underlying conception of research is identified and addressed, research training is building upon a shaky foundation". Despite the limitations, the chosen methodology and the results of the current study produced new ideas about the conceptions of supervisors from the domains of educational science and exact and natural sciences, and provided thereby some arguments for making decisions to develop doctoral studies further.

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APPENDIX

Semi-structured interview plan

- What do you think research is?
- What is the aim of doctoral study?
- What is the output of doctoral study?
- For which career is a doctoral student being prepared for during doctoral study?
- How should a doctoral student 'change' during doctoral study?
- What does a doctoral student learn and master during doctoral study?
- What should the subjects in the curriculum provide a doctoral student with?
- What is a doctoral degree?
- What is the output of a doctoral degree?
- What is the aim of a doctoral dissertation?
- What should a good-quality dissertation reflect?

* Can you expand a little on this?
* Can you give me some examples?

* *if one thing in particular is brought out, ask about other important aspects*
* *when discussing the achievement of aims, ask about the narrower (the student) and the more general sense (university, society, world)*
* *reach the idea of a product or a process when talking about the aim of doctoral studies, ask for reasoning*

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WHO IS WILLING TO TAKE LOW-STAKES ASSIGNMENTS?

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Abstract. The main purpose of this study is to explore which students of Estonian higher education institutions are willing to take low-stakes tests which have no direct consequences for them. Altogether 603 first-year undergraduates from different institutions of higher education participated in the study – 46.3 per cent of them took the low-stakes cognitive test. Female students were more willing to participate in the survey. Test-takers, compared to the students who did not take the low-stakes test measuring mental ability, had lower levels of self-evaluation and higher results in national examinations taken at the end of high school. Substantial differences between genders emerged. For male students, previous performance predicted test-taking activity, whereas no variables predicted test-taking activity in female students. When predicting test results, paradoxical relationships with motivation appeared – female students who had higher levels of motivation had lower results in the low-stakes test. It is important to take into account that when interpreting low-stakes tests significant differences could be overlooked when genders are considered together.

Keywords: higher education, low-stake assignements, academic motivation, self-evaluations, gender differences

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1. Introduction

The process of acquiring a higher education in Estonia has been changing over the last two decades. Estonian researchers have written about the possible devaluation of higher education – as higher education has become more obtainable, the number of students in Estonia has almost tripled in the last twenty years (Unt, Täht, Saar, and Helemäe 2013). The researchers found that, for many students, a degree in itself has become more important than the quality of the education they acquire. As the main purpose for many students is to pass and get a degree, not to achieve mastery of the subject matter, many education-related tasks are low-stakes

for students. Low-stakes tasks are, for example, tests that are rather trivial for students – failure or a bad grade does not result in serious consequences. So, we argue that, for many students in Estonia, the process of acquiring a higher education could be a sequence of taking low-stakes tests.

From another point of view, these kinds of tests are the quickest and easiest way for lecturers and professors to evaluate students. Testing is also widely used in low-stakes conditions in which the results of the tests are rather trivial for students. For example the Program for International Student Assessment (PISA) and the Trends in International Mathematics or Science Study (TIMSS) use standardized tests to assess the impact of education quality and to understand what causes differences in achievement across nations. The results, while important to governmental institutions, tend not to be particularly significant to students.

In order to motivate students not willing to participate in low-stakes testing and voluntary academic work, it is important to know their characteristics (i.e. academic motivation and self-evaluation [self-efficacy, self-esteem]). Furthermore, motivating students to be better in their process of acquiring knowledge would greatly improve the quality of higher education.

2. Previous studies

There have been few attempts to distinguish students who are ready to do low-stakes tests and those who are not (Brown and Gaxiola 2010, Eklöf 2010, Wise and DeMars 2005). Unfortunately, there are no studies at all investigating how different these students are in terms of psychological indicators. It is natural to investigate candidates for psychological indicators related to the willingness to take low-stakes tests from the set of psychological factors known to be related to students' academic achievement. So far, research (Deci and Ryan 2000, Marsh and Hau 2003, Rosenberg et al. 1995) has shown positive relationships between academic achievement, academic motivation, and self-evaluation, but the relationships between self-beliefs and the willingness to takes low-stakes tests have not been investigated. Therefore, the main purpose of the current study is to explore whether students' willingness to take low-stakes tests is related to their self-evaluation and academic motivation. Besides self-evaluation and academic motivation, previous academic results could play an important role in students' decision whether to take low-stakes tests or not, so we are interested in how previous academic results influence this decision. As there are reported gender differences in the case of low-stakes testing (Eklöf 2007; Schnipke 1995; Wise, Kingsbury, Thomason, and Kong, 2004)), our purpose is to investigate if there are gender differences in the willingness to take low-stakes tests and if are there differences in low-stakes tests results.

2.1. Motivation to learn and test-taking motivation

In the broad sense, motivation is defined as "to be moved to do something" (Deci and Ryan 1985). One can think about motivation as a unitary construct. It means that motivation (to act) can vary from a little to a great deal. There are quite many motivation theories, but one of the widely used approaches is to divide motivation into intrinsic and extrinsic. Intrinsic motivation refers to doing something because it is inherently interesting or enjoyable, and extrinsic motivation refers to doing something because it leads to a separable outcome.

One of the subcategories of motivation in the educational context is academic motivation – a person's desire regarding academic subjects when competence is judged against a standard of performance or excellence (Eccles and Wigfield 2002). Academic motivation and its relatedness to academic achievement have been widely researched and it is a known fact that motivation is positively related to students´ academic results (Chemers, Hu and Garcia 2001, Deci and Ryan 2000, Phan, 2010, Täht and Must 2009). It could be argued that the more motivated students are, the deeper their information processing, which in turn, is associated with higher academic achievement (Deci and Ryan 2000). It has been previously shown that academic motivation is important in assessment situations.

One specific kind of motivation has been investigated within the framework of low-stakes and high-stakes tests: according to Eklöf (2010), test-taking motivation is the motivation to perform well in a given test or in a given situation. It has been found to depend on whether the specific test is low-stakes or high-stakes for the students taking it (Brown and Gaxiola 2010, Eklöf 2010, Segal 2012, Wise and DeMars 2005). In the case of a high-stakes test, the test has at least some academic or other meaningful consequence for the student (Cole and Osterlind 2008), whereas in the context of a low-stakes assessment, there are typically no consequences (Wise and DeMars 2005). Here, motivation becomes the key element in the performance of the individual (Brown and Gaxiola 2010). Namely, when students feel that there is no consequence for them of the exam, whether positive or negative, they are less likely to be motivated to try their best (Eklöf 2010, Wise and DeMars 2005).

2.2. Self-evaluations and their relatedness to academic achievement

In addition to motivation, self-evaluations have been found to be positively related to students´ academic achievement (Marsh and Hau 2003, Pullmann and Allik 2008, Rosenberg et al. 1995). Self-evaluation could be seen as an umbrella concept that includes several different self-beliefs (Judge et al. 2002). In the current study, we have focused on general and academic self-esteem and self-efficacy. Self-esteem is an overall appraisal of one's self-worth (Rosenberg 1965), whereas academic self-esteem has been described as a self-evaluation in school performance (Rosenberg et al. 1995). Self-efficacy, however, is one's belief in one's ability to succeed in specific situations, and academic self-efficacy is an individual's belief that they can successfully succeed at a designated level on an academic task (Bandura 1977).

Self-evaluations have also been found to be related to learning and academic achievement. Self-efficacy has a positive effect on deep cognitive learning: individuals with a high sense of perceived competence are more likely to spend more time and effort on challenging goals (Prat-Sala and Redford 2010). Another important factor in the learning process is self-esteem. Individuals who feel good about themselves are more likely to succeed in learning (Phan 2010). Students who enter college with confidence in their ability to perform well academically do perform significantly better than less confident students (Chemers, Hu and Garcia 2001).

2.3. Gender differences

It is a well-known fact that there are gender differences in education: grades of girls are higher than those of boys and girls conform more with educational requirements. Mikk, Täht, and Must (2011) found gender differences in educational achievement and argued that one of the likely candidates for gender differences in educational achievement is motivation (Spinath, Freudenthaler and Neubauer 2010). Also, significant differences in test-taking activity between genders have been reported. Based on the data from TIMSS, Eklöf (2007) found that, on average, girls have higher test-taking motivation than boys. Similarly, Kinzie et al. (2007) reported that male examinees' motivation scores were 10% lower than those of female examinees. According to Cole and Osterlind (2008), female college students are more willing to take low-stakes tests than males, as 30.5% of females took the low-stakes test in question, compared to 19.5% of males. Also, Segal (2012) found females to be more likely to invest effort in tests even without incentives.

2.4. Approach with latent variables

Next, in order to avoid correlations between overlapping constructs and to get a more general understanding of how self-evaluations and academic motivation are related to the willingness to take low-stakes test we consider a latent variable approach.

Previous studies have shown that self-evaluations, specifically self-esteem and self-efficacy, are positively correlated to each other (Maccio and Schuler 2012, Dachlbeck and Lightsey 2008, Huang and Liu 2007). There is reason to believe that general and academic self-evaluation are also positively related. Pullmann and Allik (2008) pointed out that there are positive correlations between general and academic self-esteem. Judge et al. (2002) showed that self-esteem and self-efficacy are part of multidimensional construct, they named this Core Self-Evaluations. Based on different self-evaluation research**,** the same tendencies have been seen in the case of more specific self-evaluations, like general and academic self-efficacy and self-esteem (Maccio and Schuler 2012, Dachlbeck and Lightsey 2008, Pullmann and Allik 2008). So, based on previous research, it is natural to assume that self-evaluations are influenced by latent traits that include both general and academic self-esteem and self-efficacy.

Similarly, it has been found that motivation (including academic motivation) could be considered as a singular construct (Stover et al. 2012), since the structures of extrinsic and intrinsic motivation are similar (Deci and Ryan 1985, 2000). Whether intrinsic or extrinsic, motivation leads to action. Therefore a person could be simultaneously extrinsically and intrinsically motivated to do something. For example, Täht and Must (2009) showed that motivation can be seen as one latent variable.

2.5. Purpose of the study

As mentioned above, research has shown that academic motivation and students' self-evaluation are positively related to academic performance, but to our knowledge there are no studies focusing on the correlations between academic motivation, self-evaluation, and low-stakes test results. In addition, to the best of our knowledge, there are no studies assessing differences between low-stakes test-takers and non-takers in self-evaluations, academic motivation, previous academic outcome, and differences across genders in these variables. So, we believe that it is important to address these issues as they need to be taken into account in dealing with low-stakes testing. Therefore, we put forward the following questions:

1. Should the dimensionality of self-evaluative and motivational scales be reconsidered?
2. How do test-takers differ from those students who do not take the test in terms of academic motivation, self-evaluation, and previous academic results?
3. Is it possible to predict test-taking activity and test results based on academic motivation, self-evaluation, and previous academic results?
4. Are there gender differences in test-taking activity, self-evaluation, and motivation?

3. Data and method

3.1. Sample

Our research is part of a longitudinal survey focused on students' self-evaluation, learning motivation, and mental abilities. The duration of the survey was from fall 2012 to summer 2013. Undergraduates were informed about the possibility to participate in a longitudinal study via e-mail, web page, and presentations in institutions of higher education. The survey was conducted in a web-based testing environment. In this paper, we concentrate only on the data collected at the beginning of fall 2012 from first-year undergraduate students (N=603) from different institutions of higher education in Estonia. Participants filled out questionnaires about academic motivation, academic and general self-esteem and self-efficacy, and academic self-concept and completed a mental ability test (a shortened version of the scholastic aptitude test). They also reported their national examination results (NER), gender, and age. Filling out all the tests available in

the survey was not obligatory and therefore the number of respondents varies between tests. The only external motivator for answering the questionnaires and taking the mental ability test was the opportunity to find out their test results compared to other participants in the survey. The sample gender distribution was not equal: 410 of the participants were female (67%) and 193 students (33%) male. In Estonian higher education, approximately 60% of students admitted are women (Tõnisson 2011), so our sample approximately represented the student population. The average age for the sample was 20.4 years (sd = 3.2): for females 20.1 years (sd = 3.2) and male students, 21.0 years (sd = 3.1).

3.2. Measures

Five different self-report scales were used in order to measure student self-evaluation. All scales consisted of several attitudinal statements, four of which were rated on a 5-point scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Motivation scale statements were rated on a scale that ranged from 1 (strongly disagree) to 7 (strongly agree). The scale score was calculated as the total sum of the item values. We used the following scales:

- General self-efficacy (GSEf) – 5 items from the Estonian version of Schwarzer and Jerusalem Scale of General Self-Efficacy (Rimm and Jerusalem 1999).
- Academic self-efficacy (ASEf) - 16 items from the Estonian Scale of Academic Self-Efficacy (Üpraus 2009).
- General self-esteem (GSE) - the Estonian version of the Rosenberg Self-Esteem Scale (Rosenberg 1965; Pullmann and Allik 2000)
- Academic self-esteem (ASE) – an 8-item scale developed by Pullmann and Allik (2008) as an analogy to the Marsh (1992) scale for assessment of perception of self-competence in the academic domain.
- Academic motivation – the Academic Motivation Scale (AMS-C 28) College Version (Vallerand et al. 1992, 1993) Estonian version (Mägi 2012). The scale consisted of 24 items in total, of which 12 items measured intrinsic (IM) and 12 extrinsic motivation (EM).

Educational achievement was estimated by the index derived from the results of the national examination result taken when graduating from high school. In order to graduate from high school, students in Estonia have to take 5 examinations, from which at least 3 have to be national examinations. Only one national exam is obligatory – the Estonian language – and students can choose the remaining two. As the number and topics of national examinations taken is different between students, the national examination results in our study do not represent the mean score in examinations, but rather the scores students achieved in their examinations. National examination scores were self-reported on a 100-point scale. For the general national examination result index, some transformations to a 9-point scale were made. Further explanation of the scale is shown in Table 1. For instance, 9 points were received by students whose grades were all higher than 90;

8 points were received by students who had two grades higher than 90, and so on. Students whose grades were all lower than 50 got 0 on our new scale.

Table 1. The encoding of national examination scores

Encoding	Scores in national examinations
0	All grades are lower than 50
1	One grade is between 50–70, other scores are lower
2	Two grades are between 50–70, other scores are lower
3	Three grades are between 50–70, other scores are lower
4	One grade is between 79–90, other scores are lower
5	Two grades are between 79–90, other scores are lower
6	Three grades are between 79–90, other scores are lower
7	One grade is higher than 90, other scores are lower
8	Two grades are higher than 90, other scores are lower
9	All grades are higher than 90

General cognitive ability (GCA) was estimated by the shortened version of the admission test of the University of Tartu (Must and Allik 2001). The test consists of 3 sections (vocabulary, mathematics, and spatial reasoning) – there were 15 items in all subtests, with 45 questions altogether. We consider the GCA test a low-stakes test, as the test-takers had no external rewards and the test results had no consequences for them. The only motivating factor was the abovementioned personal feedback.

Test-taking activity was based on the time participants spent on different sections of the GCA test. A threshold of 6 minutes was determined based on the mean time spent on the vocabulary test, as it was the first subtest in the GCA. Based on their test-taking activity and determined threshold, participants were divided into two groups – test-takers and non-takers.

We used correlation analysis (Pearson correlations), Student t-test, factor analysis, and logistic and linear regression analysis with SPSS 20.0.

4. Results

4.1. Dimensionality of self-evaluation and motivation scales

The correlations between self-evaluation and motivation scales are low to modest – correlations are in the range of r = .132 to r = .524 (Table 2). With the aim to get a more general estimate of students' self-evaluation, factor analysis was used (principal axis factoring, Varimax rotation). The number of factors that could emerge from the analysis was not determined beforehand.

Two different dimensions emerged – one that influences academic and general self-esteem and self-efficacy (explained 35% of the common variance of variables) and another that influences intrinsic and extrinsic motivation (explained 21% of variance) (Table 3). The first factor was named self-evaluation (SEF) and the second one academic motivation (AMF).

Table 2. Correlations between self-evaluation scales and low-stakes test results (GCA)

	ASE	GSEf	ASEf	IM	EM	GCA
General self-esteem (GSE)	**.524****	**.627****	**.472****	**.157****	.066	.016
Academic self-esteem (ASE)	1	**.475****	**.577****	**.193****	–.014	**.251****
General self-efficacy (GSEf)		1	**.497****	**.243****	**.132****	.051
Academic self-efficacy (ASEf)			1	**.454****	**.247****	.018
Intrinsic motivation (IM)				1	**.508****	–.017
Extrinsic motivation (EM)					1	**–.156****

**p<0.01

Table 3. Factor structure of students' self-evaluation and motivation scales (factor loadings)

	Self-evaluation	Academic motivation
GSE	.763	
ASE	.728	
GSEf	.715	
ASEf	.662	
EM		.836
IM		.834

GSE – general self-esteem, ASE – academic self-esteem, GSEf – general self-efficacy, ASEf – academic self-efficacy, EM – extrinsic motivation, IM – intrinsic motivation.

4.2. Differences between genders

Of students who participated in our study, 46.3% (N = 279) did not take the low-stakes general cognitive ability test (non-takers). Female students were more willing to take a low-stakes test, as 58% of female students took the test compared to 44% of male students.

We used a t-test to clarify if there were any gender differences in national exam results, test results, SEF, and AMF. Female and male students were different in terms of AMF ($t(443) = 5.78$, $p<.000$) and low-stakes test results ($t(322) = –5.36$, $p<.000$) . Female students reported higher levels of academic motivation and had lower results in the low-stakes test (Table 4).

Table 4. Gender differences in national examination and test results, self-evaluation, and motivation factors

	Female		Male		t-test			Effect size
	Average	St. dev.	Average	St. dev.	t-value	df	p-value*	Cohen's d
Motivation factor	.16	.79	–.33	.94	5.78	443	**.000**	.564
Self-evaluation factor	–.05	.89	.10	.91	–1.59	443	.113	–.167
National examination result	5.98	1.78	5.78	1.86	1.24	541	.214	.110
Low-stakes test result (GCA)	22.68	10.23	29.58	10.06	–5.36	322	**.000**	–.680

4.3. Differences between test-takers and non-takers

A t-test was conducted in order to check if there were mean differences in national examination results, SEF, and AMF in the two groups that differed in terms of test-taking activity.

Test-takers, compared to non-takers, had lower levels of SEF (t (443) =2.10, p= 0.036) and higher levels of national examination results (t (541) = 4.83, p<.000) (Table 5).

Table 5. Undergraduates' SEF and national examination results. Differences between the scores of low-stakes test-takers and non-takers

	Non-takers		Test takers		t-test			Effect size
	Avg.	St. dev.	Avg.	St. dev.	t-value	df	p-value*	Cohen's d
Motivation factor	–.09	.92	.04	.86	–1.42	443	.157	–.146
Self-evaluation factor	.12	.75	–.05	.95	2.10	443	**.036**	.199
National examination result	5.49	1.81	6.23	1.74	–4.83	541	**.000**	–.417

4.4. Predicting test-taking activity

We used logistic regression in order to predict test-taking activity based on gender, SEF, AMF, and national examination results.

We used three models in logistic regression – first with genders together, second with only the male student sample, and third with only the female student sample. At first, we ran logistic regression with four variables: national examination results, SEF, AMF, and gender. AMF was not statistically significant in the model (Table 6). Models with other variables (Model 1) explained 8 to 12% of test-taking activity variability. A test of the full model against a constant-only model was statistically significant, indicating that the predictors as a set reliably distinguished between test-takers and non-takers ($\chi^2 = 37.70$, p <.000 with df = 3). Odds ratio (Exp(B)) values for gender, SEF, and national examination results are 0.41, 0.76, and 1.25, respectively. Male students and students with higher

Table 6. Predicting test-taking activity (logistic regression)

		B	Wald	Sig.	Exp(B)
Model 1	Gender	–.902	16.70	**.000**	**.406**
	Self-evaluation factor	–.272	4.74	**.030**	**.762**
	National examination result	.225	13.45	**.000**	**1.252**
Model 2	Self-evaluation factor	–.275	2.04	.154	.760
	National examination result	.583	24.62	**.000**	**1.791**
Model 3	Self-evaluation factor	–.252	2.95	.086	.777
	National examination result	–.009	.01	.915	.991

Model 1 – genders together (0 = female; 1 = male), Model 2 – only male students. Model 3 – only female students.

levels of self-evaluation are less likely to take the test whereas students with higher national examination results are more likely to take the test. Results of the logistic regression show that gender is an important variable predicting low-stakes test-taking activity, even when national examination results and self-evaluation are controlled for.

The second model (Table 6) considered only the male student sample. One statistically significant variable remained in the model: national examination results ($p < .000$). The model explained 20 – 27% of test-taking activity. A test that compared the full model against a constant only model was statistically significant ($\chi^2(2) = 33.44$, $p < .000$). Just as in the case of the general model, students who had higher levels of national examination results were more likely to take the low-stakes test (Exp(B) accordingly 1.68). In the case of the female student sample (Model 3), no statistically significant predictors occurred ($\chi^2(2) = 3.18$, $p = 204$).

4.5. Predicting test results (GCA)

We used linear regression to predict low-stakes test results. More specifically, we used gender, national examination results, SEF, and AMF as independent variables. Only gender ($t = 4.34$, $p<.000$) and national examination results ($t = 11.11$, $p<.000$) were statistically significant predictors for test results (Table 7). The model explains 36% of the variation in test results ($F(2) = 86.67$, $p<.000$). As gender is a statistically significant predictor of test results, and the previous findings bring out a number of differences between genders, we conducted a linear regression for genders separately. In the male sample, only national examination results had predictive value ($t = 6.21$, $p<.000$); the model predicted 31% of low-stakes test result variation ($F(1) = 36.23$, $p<.000$). In the female sample, both AMF ($t = –2.26$, $p = .025$) and national examination result ($t = 9.64$, $p<.000$) were significant predictors for low-stakes test results. While the relationship between test results and national examination results is positive, the relationship with motivation is negative – female students with higher motivation have lower results in the low-stakes test. The model conducted on the female

Table 7. Predicting low-stakes test results

Gender		Standardized B	t	Sig.
Total sample	NER*	.530	11.11	.000
	SEF*	.005	.107	.915
	AMF*	–.053	–1.11	.270
	Gender	.211	4.34	.000
Female	NER*	.547	9.64	.000
	SEF*	.066	1.17	.243
	AMF*	–.127	–2.26	.025
Male	NER*	.126	6.21	.000
	SEF*	–.158	–1.62	.110
	AMF*	.126	1.34	.185

Dependent variable: low-stakes test result
*NER – national examination result; SEF – self-evaluation factor; AMF – motivational factor

sample explained 32% of the variation in test results ($F(1) = 51.29$, $p<.000$). So, national examination results are an important predictor of low-stakes test results for both genders, but AMF is a significant predictor only in the female student sample. Correlations in Table 2 also illustrate the negative relationships between motivation and test results and give reason to believe that the negative predictive value is due to extrinsic motivation.

5. Discussion

Our purpose in the current study was to find out if students who are more motivated and have higher self-evaluations are more willing to participate in low-stakes tests and get better results. We were also interested to see whether their gender and previous academic results have an impact on the results of low-stakes tests. The latter would help clarify whether tests taken in low-stakes conditions are influenced by any motivational or self-evaluation factors.

Based on the results of exploratory factor analysis, we showed that four self-evaluation scales – general and academic self-esteem and self-efficacy – are influenced by one latent variable we named the self-evaluation factor (SEF). Similarly, two motivational scales – extrinsic and intrinsic motivation – were influenced by the academic motivation factor (AMF). Previous studies also support our findings (Stover et al. 2012, Täht and Must 2009).

5.1. Gender differences

Women were more willing to participate in the survey in general (70% of participants were female students) and in the low-stakes test (58% of female students took the test, whereas the percentage for male students was 44). Similar tendencies have also been reported in previous studies. Kinzie et al. (2007) found that female students devoted more time and effort to academic activities such as studying and also participated more often in a learning community. Male undergraduates, on the other hand, engage less frequently in academically challenging activities, and are systematically less engaged than their female counterparts.

Females appeared to have higher academic motivation compared to male students. This finding was supported by Eklöf (2007), according to whom female students reported a higher level of test-taking motivation than males. However, male students had higher results in the low-stakes test, which could be expected, as it was a GCA consisting of three subtests: vocabulary, mathematics, and spatial reasoning. As previous studies have shown, males tend to score higher in maths and spatial reasoning, whereas females get better results in vocabulary tests (Lynn and Mikk 2008, Mikk, Täht and Must 2012). Therefore, the overall better results of males are not surprising.

5.2. Differences between test-takers and non-takers and predicting test-taking activity

Our main purpose was to investigate if test-takers differed from non-takers in terms of motivation, self-evaluation factor, and previous academic results. Students who took the low-stakes test had lower levels of self-evaluation and higher levels of national examination results, effect sizes respectively d = .20 and d = –.42. This is congruent with the findings of Pullmann and Allik (2008), who reported that students with lower self-evaluation have been found to have higher academic achievements. We also found that gender, self-evaluation factor, and national examination results predicted 8–12% of test-taking activity.

When looking at genders separately, only male students had statistically significant differences between test-takers and non-takers in academic achievement. For male students, national examination results alone were a significant predictor, which explained 20–27% of the test-taking activity. The result is quite surprising as there were no differences between genders in national examination results, but, among males, those with higher national examination results were more willing to participate in low-stakes tests.

Our study gives reason to believe that previous success in academic work may also be a motivator to participate in low-stakes tests. Therefore, it could be that male students with higher previous results are more willing to put themselves to the test.

5.3. Predicting results of low-stakes tests

Gender and national examination result were significant predictors that predicted 36% of variance in test results. The models here were quite different when looking at genders separately. Being a male student and having higher results in national examinations also predicted higher results in the low-stakes test. For female students, both national examination results and the motivation factor predicted test results, while students with higher levels of motivation had lower results in tests. In the case of male students, only national examination results had any predictive value. This is quite unexpected and controversial as previous studies have shown that academic motivation is positively correlated with academic achievement (Deci and Ryan 2000, Eccles and Wigfield 2002, Täht and Must 2009). These new findings give reason to believe that students who are more oriented toward high academic achievement are less willing to engage in low-stakes tests. It could be speculated that, since the test results are unimportant, they cannot see any reason to waste time on taking it.

5.4. The importance for higher education

The current study could help differentiate students who are rather willing to participate in academic work for which there is no immediate gratification from those who are not. It could be argued that more willing students are easier to work with in universities as they have more motivation to study. It is often assumed by

university teaching staff that, since students have voluntarily come to obtain higher education, they are naturally oriented toward high academic achievement. However, based on the results of our research, it is important to note that if the test scores of female and male students are not looked at separately, significant differences could be overlooked. This may lead to biased results in predicting test-taking activity and outcomes in low-stakes tests. It could be speculated that since male students who have lower scores in national examinations are less motivated, they can also potentially be less willing to participate in non-obligatory academic work, i.e. attending lectures or reading additional literature. This could become a problem for them later as they may fall behind on their studies and eventually drop out of university. If higher education institutions were to address this, it could potentially help solve the problem of males having a higher dropout rate.

Furthermore, while being low-stakes for students, the tests might be highly important for institutions conducting the research. Therefore, researchers who use questionnaires, surveys, and tests should consider the possible factors influencing the validity of their studies while using student samples. An important question here is how to motivate students to take low-stakes tests as well as participate in non-obligatory academic work. One way is to raise the stakes by making participation more externally motivated. For example, to give students extra credits for attending lectures or reading additional literature recommended by lecturers.

6. Conclusion

In the current study, we found that the best predictors for test-taking activity appeared to be the results of national examinations and motivation, which is congruent with previous studies. Also, it is important to take into account that when interpreting low-stakes tests, significant differences could be overlooked when genders are considered together.

Finally, we have some ideas about how future studies on the same subject could be improved. Our sample was biased as there were significantly more female students, so we think it would be important to try to reduce this bias in future studies. Also, we had no knowledge about the background of the students, so it could be that the participating students´ level of academic motivation was higher to begin with. Moreover, the students´ emotional and physical conditions and the environment in which the test was taken could influence the results.

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TEST-TAKING EFFORT AS A PREDICTOR OF PERFORMANCE IN LOW-STAKES TESTS

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Abstract. We studied how time measures can be used as predictors of test-taking performance in low-stakes tests. Our sample consisted of undergraduate students (N = 327) who took a computer-based cognitive abilities test. Our aim was to find how test-takers' motivation manifests itself in test-taking effort. We found that a high test-taking speed is related to low test scores (the correlation between test score and Response Time Effort was r = .71). Also, the mean time for wrong answers per item was smaller than the time for right answers (mean effect size d = .22). We found that performance in low-stakes tests is influenced by two test-taking effort characteristics: the number of items the test-taker attempts to solve and the mean time that is devoted to solve an item (β = .4–.5).We suggest that test-taking motivation should be studied further as it may provide useful information for interpreting results of tests and examinations.

Keywords: test-taking effort, test-taking motivation, solution-seeking behaviour, rapid guessing, cognitive ability tests, response time effort, computer based tests, low-stakes tests

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1. Introduction

Different tests are used to measure cognitive abilities. It has been a common belief that cognitive tests give an objective and unbiased measure of students' cognitive abilities and skills. However, there are several publications indicating that test results may be influenced by several additional variables, for instance test-taking motivation, test-taking effort, and test-taking patterns can all be covariates of cognitive ability test results (e.g. Barry, Horst, Finney, Brown, and Kopp 2010, Baumert and Demmrich 2001, Eklöf 2006, 2010, Wise and DeMars 2005). Therefore, it could be complicated to get 'pure' test scores – there are reasons to expect additional influences from the motivational side of test-taking. The

Standards for Educational and Psychological Testing (American Educational Research Association, American Psychological Association, and National Council for Measurement in Education 1999) suggest that test-taking effort should be collected, reported, and used in the interpretation of test scores.

1.1. Different sides of intelligent behaviour

Early pioneers in cognitive abilities research recognized that intelligent behaviour has different dimensions. Thorndike (1927) suggested that at least three measures are needed to describe cognitive abilities: altitude, width, and speed. According to Thorndike, altitude means the measure of complexity or difficulty of operations one can perform. Width means the variety of tasks humans can solve. Speed is the number of tasks one can complete in a given time. Spearman (1927) also recognized that cognitive abilities should be described with several parameters and covariates (including speed and will), but his emphasis on general intelligence (*g*) had the strongest impact on the subsequent development of the intelligence (IQ) conception and measurement. Decades after Spearman, Furneaux (1960) made an attempt to view cognitive abilities as a problem-solving behaviour. Furneaux took into account previous ideas about the balance between speed and accuracy for describing problem-solving behaviour, but added one additional and somewhat subjective category – continuance. According to Furneaux, continuance refers to the fact that test-takers are not willing to spend unlimited time on one item and evidently they seek reasonable time allocation. For time efficiency, they can make the decision to abandon some items and try to be efficient in more familiar cases. This decision-making process can influence the assessment of cognitive abilities.

Ideas analogous to Furneaux's continuance emerged decades later in the context of analysing power and speed in cognitive testing (e.g. Partchev, De Boeck, and Steyer 2011, Sheppard and Vernon 2008, van der Maas, Molneaar, Maris, Kievit, and Borsboom 2011, van der Linden 2011). The crucial element here is the trade-off between speed and accuracy. Test-taking speed may be increased at the cost of accuracy and vice versa (Klein Entnik, Hornke, Kuhn, and Fox 2009, Parchev et al. 2011). Mental speed is measured via different indicators measuring the speed of information processing in relatively simple cognitive tasks – reaction time, general speed of processing, speed of short-term memory processing, inspection time, etc. (Sheppard and Vernon 2008). With these indicators, the mean correlation with psychometrically measured IQ is about $r = .24$ (Sheppard and Vernon 2008:542). But this modest correlation does not mean that better results in cognitive reasoning tests have been gained via faster test-taking. Wilhelm and Schulze (2002) argue that time constraints can have an impact on test performance because, due to this, some test-takers may start hurrying. Test-taking speed and mental speed are different concepts. Test-taking interest, strategy, and speed are clearly motivational ones.

1.2. Test-taking motivation

Test-taking motivation is defined as the extent to which examinees give their "best effort to the test, with the goal being to accurately represent what one knows and can do in the content area covered by the test" (Wise and DeMars 2005:2). To differentiate the degree to which the test for the test-taker is significant, the terms low-stakes and high-stakes test were adopted (see Cole and Osterlind 2008, Mislevy 1995, Sundre and Kitsantas 2004).

In education, high-stakes tests have significant consequences for the student, such as getting into university, getting his/her driver's license, and so on. Low-stakes tests, for example taking part in a survey, do not have any remarkable consequences for the student, there are no benefits attached to attaining a good result, nor are there any sanctions for a bad result. It has been found by several researchers that, in high-stakes tests, students are more motivated and get better test results than in low-stakes tests (Barry et al. 2010, Baumert and Demmrich 2001, Eklöf 2006, 2010, Sundre and Kitsantas 2004, Wise and DeMars 2005, 2010). Duckworth, Quinn, Lynam, Loeber, and Stouthamer-Loeber (2011) investigated the role of test-taking motivation in intelligence testing and concluded that under low-stakes conditions (when test results have no consequences), some individuals try harder than others. This indicates that motivation is not always low in low-stakes tests, but can vary individually. Such individuals enjoy problem-solving for its own sake, which may be a crucial factor in intellectual life.

Eklöf (2006) found that several aspects motivate some students to do their best in low-stakes tests. For example, some wanted to get better results than their peers. Another group gave social responsibility as the main reason for trying their best. A third group tried their hardest to find out about their own abilities.

Test motivation can act as a confound factor that inflates the estimates of the predictive validity of intelligence (Wicherts and Zand Scholten 2010). To understand the vulnerability of testing results due to time pressures and motivational aspects, the concepts Response Time Effort (RTE) and rapid-guessing behaviour are valuable (Wise and Kong 2005, Wise, Pastor, and Kong 2009). The relationship between test-taking speed and power and that test-takers' attitudes toward themselves and toward task performance have a profound influence on the response to tests was already recognized by Cronbach (1984).

With an aim to show that different items may need different amounts of work, Wolf, Smith, and Birnbaum (1995) coined the term 'mentally taxing items'. This directly pinpoints the amount of work item-solving needs. They found that the more difficult or time consuming the task was, the less the test-takers were motivated to invest their time and effort.

In the last decades, IQ testing methods have included computer online testing. Testing with computers has added one additional analytical measure that was absent in pencil-and-paper testing – it is possible to measure the exact time test-takers devote to the test, including at the item level.

1.3. Test-taking motivation as a belief

According to expectancy-value theory (Atkinson 1957), individuals' performance can be explained by their beliefs about how well they will do on the activity (expectancies) and the extent to which they value the activity. Or, in other words, expectancy theory states that the relative value and probability of success are the key determinants (see Eccles and Wigfield 2002, Wigfield and Eccles 2000, Barry and Finney 2009).

As test-taking motivation is considered to be a belief, many researchers have used self-report questionnaires, mostly the Student Opinion Scale (Sundre and Moore 2002), to study test-takers' motivation and effort. However, it has been noted that the results of the questionnaire may be biased by social desirability and test-taking experience. This is why researchers have been trying to find behavioural parallels to motivational beliefs. Analysing test-taking behaviour through time parameters could give a more objective sense of test-taking motivation, and how it manifests in the results through test-taking effort than self-reports.

1.4. Describing motivation and effort through time parameters

The concept of motivation is very general, meaning the energisation and direction of behaviour. Test-taking effort is behaviour, or in other words motivation put into action. There have been the first promising attempts to describe test-taking motivation and effort through time parameters (Wise and Kong 2005). Besides self-reports, motivation and effort in the testing situation can be described by some simple indicators, especially in a low-stakes testing situation:

1. The amount of work: the number of items that test-takers tried to solve.
2. The quality of work: the number of right answers.
3. The time devoted to the test.
4. The speed of accomplishments (ratio of the amount of work to the time used for testing).

One prolific example of using behavioural indices for describing test-taking motivation is that of Wise and Kong (2005), who introduced the method of Response Time Effort (RTE), which is based on item response time to measure examinee test-taking effort on computer-based test items. RTE is based on the hypothesis that when an item is administered, unmotivated examinees will answer too quickly (i.e. before they have time to read and fully consider the item).

1.5. The aim and hypothesis of the current paper

The aim of the current paper is to find how test-takers' motivation through test-taking effort manifests itself in test results using test-taking time parameters as measures of test-taking effort.

Various sources have shown substantial differences between power and speed dimensions in cognitive test performance (e.g. Partchev et al. 2011, van der Linden 2011); these findings concerning the differences in the mental taxation of items (Wolf et al. 1995), RTE, and rapid guessing (Wise and DeMars 2005, Wise

and Kong 2005, Wise et al. 2009), as well as the perceived consequences of the test results on the test-takers (Wolf and Smith 1995), allow us to propose the following hypothesis for the current investigation:

Test results in low-stakes testing situations are partly explained by test-taking effort, which can be described with test-taking time parameters.

More specifically: 1. High test-taking speed is related to low test scores; 2. The mean time for wrong answers per item is smaller than the time for right answers per item; and 3. Estimated performance in a low-stakes testing situation is influenced by two test-taking effort characteristics: the number of items the test-taker attempts to solve and the mean time that is devoted to solve an item.

2. Method

2.1. Sample and procedure

We investigated the test-taking behaviour of first-year students under the condition of absent external reward for testing results, meaning the test can be considered as a low-stakes test. Our research is a part of a bigger project focusing on students' self-evaluations, learning motivation, and mental abilities. In this paper, we concentrate only on the results of a mental ability test. Our sample consists of 327 first-year students from Estonian institutions of higher education; 86 (26.3%) of them were male and 241 (73.7%) female. Participation was voluntary. We invited them to participate in our research through mailing lists and visited some colleges, where we had the opportunity to introduce our study. The only external motivator was the opportunity to get personal feedback.

2.2. Mental abilities test

The mental abilities test we used is the short version of the scholastic aptitude test of the University of Tartu (Must and Allik 2002). It consists of three subscales – vocabulary, mathematics, and spatial reasoning – with 15 items in each, and altogether 45 items. The test was assembled from scholastic aptitude test items from the years 2008–2012, considering their empirical level of difficulty (M = .58, SD = .09), meaning that selected test items in all subtests should be equally difficult – that is, the difficulty level throughout the test is not progressive. The research was conducted via the Internet in an online research environment and there was a 60 minute time limit for the test, which should be long enough to answer all the items with no time pressure. The time limit was set to ensure that items were answered sequentially, with no long disruptions.

The questions in the subtests are somewhat different in their nature. For example, here are two different questions from the vocabulary subtest:

*1) The meanings of the words **egg** and **seed** are*

a) similar
b) opposite
c) neither similar nor opposite

2) Here are five sentences in which the words have similar functions. Find one sentence that is different from the rest.

A) A boy is running in a forest
B) A girl is walking in a park
C) A farmer is disappointed in the field
D) Father is jumping in the garden
E) Brother is swimming in the pool

An example from the mathematics subtest:

There are 40 boys in the class. 18 of them play football and 24 play basketball. 12 boys play both games. How many of them don't play either of these games?

A 8 B 10 C 12 D 14 E 16

Most of the items in the spatial reasoning subtest included an illustration. There were several kinds of tasks, such as mental rotation, identifying the missing item in a row of items, etc. For example:

Which of these cubes is not in accordance with the given surface?

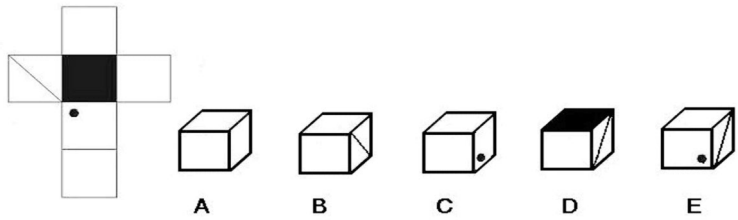

Figure 1. An item from the spatial reasoning subtest.

In the instructions, test-takers were also encouraged to use a paper and pen for calculations, but not a calculator.

2.3. Time measures

As the test was taken via the Internet, we had the opportunity to investigate how the test-takers use the time given to them on the test. The time countdown of 60 minutes was visible to the respondents on the computer screen, but they did not know that we measured their use of time at the item level.

Besides the times measured at the item and test level, we also used the RTE measure developed by Wise and Kong (2005). According to the latter, a test is considered to be a series of items presented to an examinee, and the presence of solution behaviour is evaluated for each item. For item *i,* there is a threshold, *Ti,* that represents the response time boundary between rapid-guessing behaviour and solution behaviour. Given an examinee *j*'s response time, *RTij,* to item *i,* a dichotomous index of item solution behaviour, *SBij,* is computed as

$$SB_{ij} = \begin{pmatrix} 1 & \text{if } RT_{ij} \geq T_i \\ 0 & \text{otherwise} \end{pmatrix} \quad (1)$$

The index of overall RTE for examinee *j* to the test is given by

$$RTE_j = \frac{\Sigma SB_{ij}}{k} \quad (2)$$

where k = the number of items in the test. RTE scores range from 0 to 1 and represent the proportion of test items for which the examinees exhibited solution behaviour. RTE values near 1 indicate strong examinee effort to the test, and the further a value falls below 1, the less effort the examinee expended (Wise and Kong 2005).

To find the threshold for every test item, which is the boundary between rapid guessing and solution behaviours, we took into account the length and nature of the item. Wise and Kong (2005, p. 171) used 3 thresholds for the classification of test-taking depending on the item length. If an item was shorter than 200 characters, a 3-second threshold was used. If an item was longer than 1,000 characters, a 10-second threshold was used. For the remaining items, a 5-second threshold was used. Those thresholds were empirical and partly explained by the fact that the frequencies of item response times had two tops which allowed such separation.

We did not find a similar pattern in the frequency graphs to Wise and Kong (2005), and therefore we could not use this in identifying thresholds. However, we took into account the length of items, which in our case was no longer than 1,000 characters. For all the items in the mathematics and spatial reasoning subtest, both under and over 200 characters, we used a threshold of 5 seconds. We decided to use a 5 second threshold instead of a 3 second threshold for items under 200 characters, because, in these subtests, the item needs more attention than just reading them through, namely, calculation and mentally processing the figures.

In the vocabulary subtest, we used a threshold of 5 seconds on 10 items and, on the remaining 5 items, 3 seconds, based on item length. Therefore our thresholds are analogous to the ones used by Wise and Kong (2005).

2.4. Predicting performance in low-stakes tests

The concept of general intelligence claims that cognitive abilities can be described with one latent variable – the g factor (see Jensen 1998). In low-stakes tests, it seems that besides intelligence, other factors, such as motivation and effort, play a role in test performance. Therefore, we view test-taking performance as a latent variable in low-stakes testing results, indicating that, besides cognitive ability, it contains test-taking motivation. Our aim is to create a model describing how test-taking performance is influenced by two test-taking effort characteristics: the number of items the test-taker attempts to solve (continuance) and the mean time devoted to solve an item (speed).

Similarly to general intelligence theory, we hypothesize that behind the results of the three subtests, there is one common latent variable – performance in low-stakes tests – which is regressed on two test-taking effort characteristics: the number of solved items and mean time on an item.

3. Results

3.1. Results of the cognitive abilities test

The maximum possible score for the test was 45 points: 15 points for every subtest. In our study, the maximum score obtained was 43 points.

The mean scores of all subtests, with mean times for passing the subtests, are provided in Table 1.

Table 1. Mean scores and test-taking time for each subtest (N = 327)

Subtests	Mean score	SD	Max	Min	Mean time (min)	SD
Vocabulary	8.62	3.05	15	0	6.60	2.38
Mathematics	8.35	4.79	15	0	15.02	8.83
Spatial reasoning	7.33	4.47	15	0	12.17	7.03
Total test score	24.31	10.75	43	0	33.80	15.14

The highest mean score was in the vocabulary subtest and the lowest in the spatial reasoning. In every subtest, the maximum possible score was reached by at least one test-taker, but no one obtained the maximum score in all three subtests.

3.2. Test-taking time and perseverance of test-takers

When looking at test-taking patterns, it can be seen that many students abandon the test-taking process before the given 60 minutes for the test. The portion of students who abandoned the test-taking before reaching the third subtest was 16%, meaning that plenty of students did not pass the whole test and abandoned the test with only some experience with it. Test-taking time for all 45 items varied considerably– ranging from 6 to 60 minutes. Figure 2 illustrates at what stage test-takers abandoned the test.

As can be seen, the largest drop comes after question number 15 – this is where vocabulary subtest ends and mathematics subtest begins.

The correlation between the test score and total test-taking time was r = .716. The correlations are different within subtests, being the highest in the spatial reasoning (r = .789) and mathematics (r = .622) and the lowest in the vocabulary subtest (r = .236).

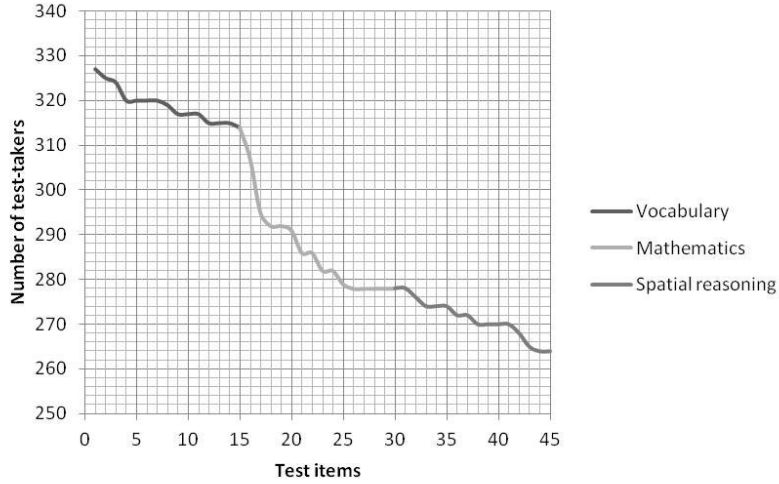

Figure 2. Test abandoning tendencies throughout the test.

3.3. Test results and response time effort

Based on the set time thresholds and response times for every item, we calculated the RTE index (see Equations 1 and 2) for every test-taker. The index can vary from 0 to 1 and shows the number of test items on which the respondent took enough time to read and answer the question. For example, RTE index .70 means that, on 70% of the items, the response time was over the threshold and to the remaining 30% of the items the answers were given too quickly.

Figure 3 illustrates how the mean score of the test changes when we take into account the different RTE results of the test-takers. The correlation between RTE and total test score is r = .71.

It is evident that students with an RTE of less than .20 obtained only 55.4% of the possible score, whereas students with an RTE of over .90 obtained 62.6% of the possible score. The association between RTE and test score is close to linear.

3.4. Response times to right and wrong answers.

Secondly, we supposed that wrong answers are given more quickly than right answers, indicating that right answers demand time investment, and wrong answers may be given due to hurrying. For every item we calculated the mean answering times for right answers and wrong answers, and found the effect size Cohen's d (d) between means.

The relationships between times to right and wrong answers at the item level are shown in Figure 4. A positive effect size indicates that wrong answers were given faster than right answers. For greater clarity, the effects are in ascending order (there were 15 items in every subtest).

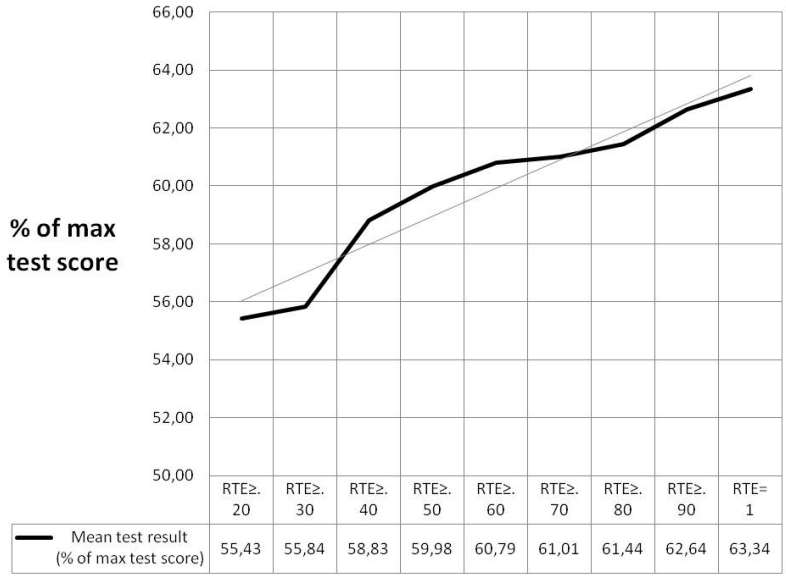

Figure 3. Association between Response Time Effort and test result.

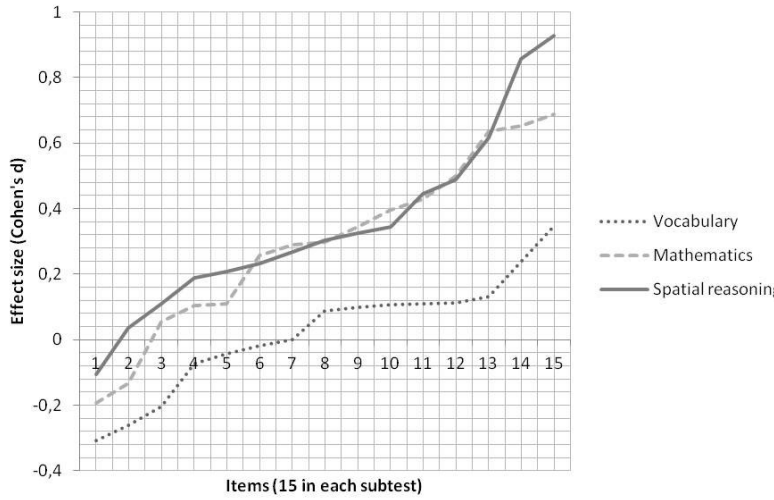

Figure 4. The relationships between times to right and wrong answers at the item level.

Although in all subtests the right answers generally took more time than wrong ones, in some cases, especially in the vocabulary subtest (d = .02), the opposite was true. The difference between times to wrong and right answers is most clear in the mathematics (d = .30) and spatial reasoning subtests (d = .35). Also, effect sizes are strongly correlated with the order of the items in the test (r = .53,

p<.001). This correlation seems to affirm the two test-taking strategies – the ones who persevere with the test either spend more time and effort on the items and therefore have a greater probability of finding the right answer (more time spent on right answers) or guess rapidly (less time spent on wrong answers).

3.5. Test-taking effort as a predictor of test performance in low-stakes tests

To explain results of cognitive tests as a function of mental abilities and motivation, we named the latent variable 'test-taking performance in low-stakes tests' (in short 'performance', see figure 5). The intensity of performance explains the results of concrete subtests. The performance variable is regressed on the number of items the test-takers attempted to solve and on the time test-takers devoted to item solutions.

The model simply shows that the more items a test-taker solves and the more time they spend on an item, the higher the results.

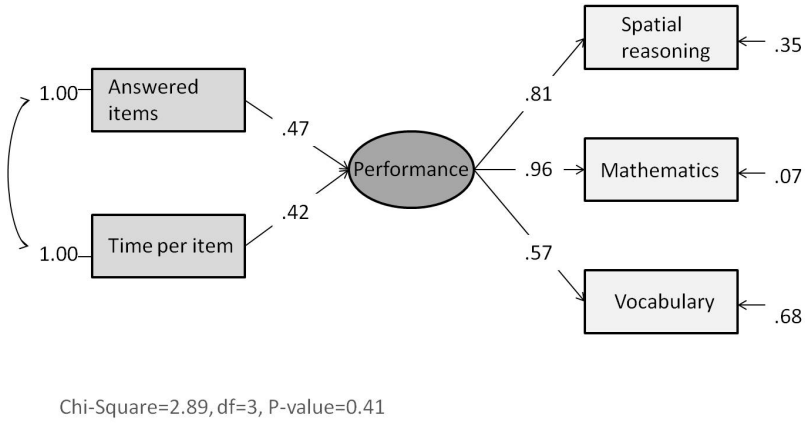

Figure 5. Test-taking effort as a predictor of test performance in low-stakes tests. Path diagram.

The subtests loaded on the common latent performance variable with loadings .57–.96. The model assumed that the test-scores in the three subtests were influenced by one latent variable of performance in low-stakes tests. The correlations between the latent performance and results from the subtests show that in the current test performance was mostly related to results in the mathematics subtest and least related to results in the vocabulary subtest.

The model shows that both predictors of performance (indicators of test-taking effort: items answered, time per item) have approximately the same prognostic value ($\beta = .47$ for items answered and $\beta = .42$ for mean time). The χ^2 (df = 3) = 2.89, p = .41 result demonstrates that the model fits perfectly with the data. The covariance between the number of answered items and the test result in spatial reasoning is allowed to be free. This exception is explained by the fact that the

subtest of spatial reasoning is at the end of the test-battery and, therefore, answering there is more influenced by the low-stakes condition.

According to the model, we suggest that when interpreting test results, test-taking effort should be taken into account. If the effort indicators are high, it can be assumed that the test result reflects cognitive ability, if not, then any conclusions about test-taker's cognitive ability cannot be made.

4. Discussion

4.1 Findings

When low-stakes assessments are administered, the degree to which examinees do their best is often unclear, complicating the validity and interpretation of the test scores. This is highly important in the era of testing via Internet, as the testing conditions are very flexible: testing can take place at any time and in any situation.

It is clear that in simple cognitive tasks, elementary mental speed is positively connected to IQ (Sheppard and Vernon 2008). The tasks used in the current research were more difficult and we found that test-taking speed in low-stakes testing conditions has an inverse relationship with the attained results. This contradicts the overall belief that smart students solve individual tasks faster and have higher scores in tests. We concluded that in low-stakes testing situations something else besides intelligence and mental speed plays a significant role. We attributed this to motivation, which is seen as how much effort the test-taker puts into the test. Motivation was viewed on the basis how test-takers use the time given for the test.

All three hypotheses of our study (p. 10) were confirmed. We replicated the finding of Wise and Kong (2005) about RTE – small response times are a signal of low test-scores (first hypothesis). Also, consistent with RTE findings, at the item level, the mean time for wrong answers was shorter than the mean time for right answers (second hypothesis). Generally, our data supported this relationship on two subscales: mathematics and spatial reasoning. In the vocabulary subtest, this difference was not observed. The vocabulary subtest was the first subtest, and although the items were selected following the same principle (difficulty level around $p = .50$) from the admission test item database, this subtest for the test-takers differed from the mathematics and spatial reasoning subtests. Evidently items about mathematical and spatial reasoning require more attention and analysis, and this is the reason why giving correct answers needs more time. Therefore, the difference in effort management might not come from the difficulty level as much as from the mental taxation.

Lastly, we found that test performance could be predicted by two effort indicators: the number of items solved and the mean time devoted to solve an item (third hypothesis). We found that, when difficulty levels of the items are similar, the number of items solved and mean time of an item (as indicators of effort) can predict performance in low-stakes tests. Latent variable performance indicates that

the obtained result is not only connected to mental abilities but also influenced by the manifestation of motivation in behavior.

4.2. Limitations

Using the concept of RTE has some limitations. Firstly, the thresholds are set considering basically only the length of items. With more precise thresholds, RTE could be more salient and informative. One way in which to do this is to get data from a high-stakes testing situation and find the minimal times for giving the right answer to every item. In the present study, the correlation between RTE and test result (r = .710) was very similar to the correlation between test result and test-taking time (r = .716). Still, RTE could distinguish the motivated from the unmotivated better. For example, we may have two test-takers who both have the same test-taking time, but different RTE indexes. Especially in online testing, we cannot be sure under what circumstances the test is being done. When doing other things at the same time, one might only answer a few questions in the given time for the test – in that case, test-taking time can be long but the RTE index low, because of the unanswered questions.

4.3. Implications and recommendations

The current research can be interpreted within the broader context of higher education today. On the one hand, Unt, Täht, Saar, and Helemäe (2013) write about the possible devaluation of higher education in Estonia, meaning that, in the last decades, higher education has become more obtainable and the number of students in Estonia has almost trippled in the last twenty years. On the other hand, the researchers also found that, for many students, a degree in itself has become more important than the field of study or major in which it has been acquired. Therefore, it is possible that many education-related tasks are low-stakes, because the main purpose is to pass, not for students to try their hardest or master the subject matter.

It would be important to learn about students' motivation and effort management in educational situations which should be high-stakes for them, such as exams and tests necessary for getting credit points. Nowadays, some exams are already taken on computers and these would be ideal for learning about motivation using time measures. It is especially the case that this should be studied in multiple choice tests, where students have the theoretical opportunity to pass by random guessing ("bingo"). The results of this kind of research could give insight into our education system and students' learning motivation. Longitudinal data could be informative about the usefulness and outcomes of different kinds of test-taking and learning strategies.

The availability and therefore the possible devaluation of education in different countries could vary considerably. This means that the students' attitude and motivation towards educational tasks are probably different which, in turn, means that comparing educational outcomes or results in tests across nations may not give the information we expect, for the balance between intelligence and motiva-

tion may be different. The same test or any other educational task that is high-stakes for one, could be low-stakes for others. What may seem like a difference in intelligence may be a difference in motivation, or both.

One opportunity for getting more reliable data, is to try to ensure the test is high-stakes to the test-taker, meaning that the result should have a meaningful consequence or value. If time measures are taken into account in surveys, the possibility of filtrating the data can be considered. This could be done using the Response Time Effort index, for example, using only data from test-takers with an RTE over .90. Filtering could be especially important when comparing two groups where motivation and effort have been different.

In today's world, we have many opportunities to choose from, but only a limited amount of resources. Priorities and values largely determine where and in what we invest our time and energy. The more value anything has to an individual, the more effort they are willing to put into it. Without knowing the backround, we can make wrong interpretations when we only know the outcome. When our aim is to determine maximum abilities, we have to be sure we are looking at a situation where the person has invested maximal effort. As actions sometimes speak louder than words, it is good to use behavioral measures beside self-reports, for they both could provide useful information.

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