Teacher Education Policy in Europe (TEPE) Conference 2010

Tallinn University, Estonia

Thursday 30th September- Saturday 2nd October 2010

Call for papers on the theme:

*Developing Quality Cultures in Teacher Education: Expanding horizons in relation to quality assurance*

The Joint Declaration of European Ministers of Education – the Bologna Declaration of June 1999 – called for the promotion of European co-operation in Quality Assurance (QA) with a view to developing comparable criteria and methodologies. During the past decade, Higher Education Institutions have participated in the development and implementation of procedures for QA at institutional and national levels. Accountability systems and structures have been developed in response to the need for self-evaluation systems and processes within higher education but also in response to demands from external stakeholders, such as professional bodies and national government agencies. At the same time, essential academic values and understandings have been challenged by the deepened impact of market forces and new forms of management within higher education institutions. In some instances this has led to the development of cultures of compliance and instrumental approaches to QA. At the Bergen Ministerial Conference in 2005, common European standards and guidelines for QA were approved and have been implemented in almost all national systems. Today, QA is mainly carried out at university level encompassing all disciplines and study areas. On the other hand, in some disciplines and study areas, we witness specific approaches to developing quality cultures at the European level with respect to the specific nature of a discipline. Teacher education faces particular challenges in the promotion of co-operation in QA due to the very diverse approaches towards its organisation at the national level and its resulting fragmentation at the European level.

Against this background, the Board of the TEPE Network considers it to be timely to elaborate responses based on collegial collaboration, research and a pro-active approach from within the education community in Europe. Accordingly you are invited to participate in the 4th Annual Conference of the Teacher Education Policy in Europe (TEPE) Network to be held at Tallinn University between 30th September and 2nd October 2010. In particular, you are invited to submit a proposal to present a research paper which addresses these issues in relation to the goals of the network which are outlined below.

The quality of teacher education is a matter for debate at national level throughout Europe at this time. The crucial questions proposed here are:

- What do teacher educators understand as high quality in teacher education and how can it be assured, enhanced and researched?
- What kinds of measures are required to develop quality cultures within initial teacher education, induction and continuous professional development?
- What activities already exist in developing quality cultures between teacher education institutions or can be launched at national, regional and European level?
- What are the obstacles preventing such collaboration and how can they be overcome?
The central goals of the Teacher Education Policy in Europe (TEPE) Network are to:

- Advance research in and on teacher education
- Increase mobility and extend the European Dimension in teacher education
- Enhance quality through the renewal of evaluation cultures in teacher education

For further detail see the TEPE web site at: http://tepe.wordpress.com/

**Important Dates**

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<tr>
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<td>Submission of abstracts</td>
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<td>Decisions on proposals</td>
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<td>Submission of papers</td>
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Details of Key Note speakers will be announced later.

**Submission of abstracts**

Abstracts should consist of up to 300 words including key words and title.
You can submit your abstract here: [https://www.easychair.org/login.cgi?conf=tepe2010](https://www.easychair.org/login.cgi?conf=tepe2010)

If you are a new user, you will need to sign up an EasyChair account first of all by following the guidelines available on the web site.

**Criteria for the evaluation of papers**

Reviewers will evaluate papers according to the following criteria:

1. Does the paper clearly address at least one of the central goals of the TEPE Network?
2. Does the paper present innovative ideas and new knowledge on the subject under examination?
3. Does the paper present clear policy recommendations related to teacher education?
4. Does the paper fit with the technical requirements e.g. the length (4000-6000 words), references and quality of language?

**Further information**

Further information including details of registration and accommodation will be available on the conference website web site shortly: [http://eduko.archimedes.ee/tepe2010](http://eduko.archimedes.ee/tepe2010)

**Contact person in Estonia:**

Direct enquiries about the conference may be made through the following contact:

Monika Maamagi, Adviser of Eduko Unit, Archimedes Foundation.
Phone: +372 699 9394/+372 527 8037
Email: monika.maamagi@archimedes.ee

**Co-organiser**

The conference is being co-organised and financed by Eduko programme. The aim of Eduko programme is to support the development of educational sciences and teacher training in Estonia. Eduko programme is funded by the European Social Fund.

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<th>Dr Björn Åstrand</th>
<th>Prof Brian Hudson</th>
<th>Dr Eve Eisenschmidt</th>
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<td>Chair of TEPE Board</td>
<td>TEPE Network Co-ordinator</td>
<td>Chair of Local Organising</td>
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<td>School of Education</td>
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<td>University of Dundee</td>
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### Developing Quality Cultures in Teacher Education: Expanding horizons in relation to quality assurance

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<td>17:00-19:00</td>
<td>Registration of participants</td>
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<td>17:15-17:45</td>
<td>Briefing session for chairs, rapporteurs and panel members</td>
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<td>18:00-18:30</td>
<td><strong>Opening of the conference</strong></td>
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<td>18:00</td>
<td>Professor Prit Reiska, Vice-Rector for Academic Affairs, Tallinn University</td>
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<td>18:01</td>
<td>Dr. Björn Åstrand, Dean of Umeå School of Education, Chair of TEPE Network Board</td>
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<td>18:02</td>
<td>Professor Brian Hudson, Associate Dean, School of Education, Social Work and Community Education, University of Dundee, Co-ordinator of TEPE Network</td>
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<td>18:03</td>
<td>Dr. Eve Eisenschmidt, Director of Tallinn University Haapsalu College, Chair of Local Organising Committee</td>
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<tr>
<td>18:30-19:30</td>
<td><strong>Evening key note speech</strong></td>
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<td>18:30</td>
<td><em>Teacher Education Policy in Times of Transition</em></td>
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<td>18:31</td>
<td>Professor Stefan Hopmann, University of Vienna</td>
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<td>18:32</td>
<td>Transition points here to fundamental changes in different areas, which have an impact on the future of teacher education in many parts of Europe, namely changes in the fabric of schooling, changes in the public management of expectations of what teachers and schools should be able to do, changes in the ways of how teacher education and teaching are governed, and - last but not least - the impact of declining public spending on higher education as well as on schooling. I will discuss these challenges in relation to a new, innovative concept of teacher education, which has been developed in Austria as part of an initiative to transform the current system of teacher education, and in relation to other examples from the current wave of teacher education reforms in quite a few European countries.</td>
<td>Mare-building, Atrium</td>
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<td>19:30-20.30</td>
<td><strong>Welcome drink</strong></td>
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**Venue:** Tallinn University, Uus-Sadama 5, Mare-building
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<tr>
<td>8:00-9:00</td>
<td>Registration of participants</td>
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<td>9:00-11:30</td>
<td><strong>First plenary session</strong>&lt;br&gt;Chair of the session: Björn Åstrand</td>
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<td>9:00-10:00</td>
<td><strong>Key note speech</strong>&lt;br&gt;Improving the Quality of Teacher Education: Focus on Teachers’ Skills and Competences&lt;br&gt;Adjunct professor Ellen Piesanen, University of Jyväskylä, Finnish Institute for Educational Research</td>
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<td>Tallinn Hall</td>
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<td>9:00-10:00</td>
<td>Teacher Education (TE) is regarded as one key factor in determining whether the European Union can increase its competitiveness in the increasingly globalised word. To improve the quality of TE as well as the quality of teaching and training at schools, teachers’ skills and competences must be on real time and updated both in TE as well as in induction phase and in continuing teacher education. The concern about TE in Europe has been raised by different studies that have revealed several shortcomings in TE. These findings accordingly prompted the EC to adopt the Commission Communication ‘Improving the Quality of TE’, which led to the related Council Conclusions. The presentation bases on the results of ‘The Teacher Education Curricula in the EU’ project carried out in 2008-2009 in University of Jyväskylä. The main focus of the project was on the teachers’ skills and competences referred to in these EU documents, and to what extent they have been taken into consideration in the TE curricula of the 27 Member States. In the project teachers’ skills and competences were clustered into eight groups: subject competences, pedagogical competences, integrating theory and practice, co-operation and collaboration, quality assurance, mobility, leadership and continuing and lifelong learning.</td>
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<td>Tallinn Hall</td>
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<td>10:00-10:30</td>
<td>Coffee break</td>
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<td>10:30-11:30</td>
<td><strong>Key note speech</strong>&lt;br&gt;Quality Assurance in Teacher Education in Ireland, within an International Context&lt;br&gt;Former Professor of Education John Coolahan, National University of Ireland, Maynooth</td>
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<td>Tallinn Hall</td>
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<td>10:30-11:30</td>
<td>The paper outlines the tradition and structure of teacher education in Ireland. It then explores new approaches towards QA in relation to international policy lines such as those of the EU and the OECD. The paper links trends in TE with the broader moves on QA in the National Qualifications Framework and the European Meta-Frameworks. It then examines the Teaching Council of Ireland’s work on QA and draws the different strands together as a productive work in progress.</td>
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<td>11:30-13:30</td>
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<td>12:15-13:15</td>
<td>TEPE board meeting</td>
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<td>13:30-15:00</td>
<td><strong>Parallel working groups, session 1</strong></td>
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<td><strong>Group I – Recent Trends in Teacher Education</strong></td>
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<td><strong>Tallinn Hall</strong></td>
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<td>Chair: Joanna Michalak</td>
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<td>Rapporteur: Marco Snoek</td>
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<td><strong>Group II – Dilemmas in Initial Teacher Education</strong></td>
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<td><strong>Auditorium M-213</strong></td>
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<td>Chair: Jens Rasmussen</td>
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<td>Rapporteur: Brian Hudson</td>
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<td><strong>Group III – Learning Activities in Teacher Education</strong></td>
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<td>Chair: Björn Åstrand</td>
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<td>Rapporteur: Erika Löfström</td>
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<td><strong>Group IV – Teachers as Members of Professional Community</strong></td>
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<td>Chair: Eve Eisenschmidt</td>
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<td>Rapporteur: Tiina Anspal</td>
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<td><strong>Beach and Bagley – New Threats in Advanced Knowledge-Based Economies</strong></td>
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<td>to the Old Problem of Developing and Sustaining Quality Teacher Education</td>
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<td><strong>Rasmussen and Bayer – Comparative Study of Teaching Content in Teacher Education Programmes in Canada, Denmark, Finland and Singapore</strong></td>
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<td><strong>Dremljuga-Telk, Koitla, Kusnets, Kusmin, Niitsoo, Pilt, Plank, Varendi, Vilems – E-learning Quality Assurance System for E-Courses in Estonia</strong></td>
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<td><strong>Van de Velde and Lammens – Quality Assurance in Teacher Training in Flanders</strong></td>
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<td><strong>Komsaare – The Range of Methods in Estonian Teacher-Training Curricula</strong></td>
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<td><strong>Lamas and Montero – Didactics Perspectives in Curriculum Areas [DPCA] – a Doctoral Programme under the Parcercy USC-IP. Evaluation of the Impact of Some of the Researches Developed on the Contexts as Well as on the Subjects Envolved</strong></td>
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<td><strong>Milovic and Bolitho – In-Service Teacher Trainers’ Development Programme in Croatia – Impact and Challenges</strong></td>
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<td><strong>Pedaste, Leijen, Saluveer and Laur – Facilitation and Hindrance of Change: Characteristics of Collaboration in Teacher Education in a Large-Scale University</strong></td>
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<td><strong>Zascerinska and Lasmanis – Designing a Qualitative Research for Evaluation of English for Academic Purposes Activity in Teacher Education</strong></td>
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<td><strong>Wilson – Beyond Compliance: University–School Network Learning Partnerships</strong></td>
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<td><strong>Hinostroza and Brun – Research on ICT Integration for Enhancing Quality in Teacher Education: Nationwide Policy or Global Challenge?</strong></td>
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<td><strong>Rüütmann and Kipper – Essential Aspects of Quality Assurance in Technical Teacher Education at Tallinn University of Technology</strong></td>
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<td><strong>Eisenschmidt, Oder and Meristo – With Five Years of Teaching Experience: Professional Aims and Tenure</strong></td>
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<td>Time</td>
<td>Parallel working groups, session 2</td>
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| 15:30-17:00  | **Group I – Recent Trends in Teacher Education**  
**Tallinn Hall**  
Chair: Joanna Michalak  
Rapporteur: Marco Snoek  
Snoek – Raising the Professionalism of Teachers? Content Elements for Post-Initial Master’s Level Programs |
|              | **Group II – Dilemmas in Initial Teacher Education**  
**Auditorium M-213**  
Chair: Jens Rasmussen  
Rapporteur: Brian Hudson  
Hudson and Henderson – What is Subject Content Knowledge in Mathematics? On the Implications for Student Teachers’ Competence and Confidence in Teaching Mathematics |
|              | **Group III – Learning Activities in Teacher Education**  
**Auditorium M-224**  
Chair: Björn Åstrand  
Rapporteur: Erika Löfström  
Selke – Music Teacher Education and Beliefs About Musicality as a Prerequisite for Music Teacher’s Attitudes |
|              | **Michalak – Teacher Education in the Context of Improving Quality in Higher Education in Poland** |
|              | **Uusen – The Quality of Initial Teacher Education in the Tallinn University by the Opinion of Student Class Teachers** |
|              | **Kasesalu, Piht and Lehiste – Does Initial Teacher Education Meet the Real Needs?** |
|              | **Marchis – Mathematics Teachers’ Self-Regulated Learning Competencies** |
|              | **Ciascai and Haiduc – The Study of Natural Sciences and Teacher Training** |
|              | **Zascerinska and Surikova – Conditions for Student Teacher Professional Development** |

19:00-21:00  
Conference reception  
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<td>9:00-12:00</td>
<td><strong>Second plenary session</strong> Chair of the session: Eve Eisenschmidt</td>
<td>Tallinn University, Uus-Sadama 5, Mare-building</td>
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<td>9:00-10:00</td>
<td><strong>Key note speech</strong> <strong>Why European Teacher Education Institutions Should Develop Common Quality Standards?</strong>&lt;br&gt;Professor Pavel Zgaga, University of Ljubljana</td>
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<td>10:00-11:00</td>
<td><strong>Panel discussion</strong> <strong>Developing Quality Cultures in Teacher Education: Expanding horizons in relation to quality assurance</strong>&lt;br&gt;The following questions will be discussed:&lt;br&gt;- The quality of teacher education is a matter for debate at the national level throughout Europe at this time.&lt;br&gt;- The crucial questions proposed here are what do teacher educators understand as high quality in teacher education and how can it be assured, enhanced and researched?&lt;br&gt;- What are feasible measures to advance teacher education and to develop quality cultures within initial teacher education, induction to the profession and continuing professional development?&lt;br&gt;Participants: researchers, teacher educators, students teachers</td>
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<td>11:00-11:30</td>
<td><strong>Coffee break</strong></td>
<td>Mare-building, Atrium</td>
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<td>11:30-12:00</td>
<td><strong>Closing session</strong></td>
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<td>11:30-12:15</td>
<td><strong>Reports from working groups</strong></td>
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<td>12:15-12:45</td>
<td><strong>Conclusions, recommendations and closing of the conference</strong>&lt;br&gt;Björn Åstrand and Brian Hudson</td>
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<td>12:45-13:15</td>
<td><strong>Light meal</strong></td>
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New Threats in Advanced Knowledge-Based Economies to the Old Problem of Developing and Sustaining Quality Teacher Education

Dennis Beach, University of Borås and Carl Bagley, Durham University

Certain common elements can be identified regarding teacher education programmes and their development in advanced knowledge-based economies, by which we mean nation states that are thoroughly reliant on knowledge production and communication for economic stability and growth and the smooth running of their institutions. They have their basis in two strong ideas. The first is the relationship between formal education (schooling) and economic production and the role of teacher education in respect to this relationship. The second is the idea of the modern university in these relationships and the place of educations for the higher- and even semi-professions as part of this university concept. These ideas are somewhat linked to the principles of university organisation developed by Wilhelm von Humboldt and have been recognised by amongst others the deceased British sociologist of education Basil Bernstein (1990, 1996). They can be expressed broadly as follows:

- Scientific knowledge is increasingly essential for economic growth and social, technological and cultural development
- Scientific autonomy is essential to the development of scientific knowledge and this knowledge should be developed in special institutions that are governed by the principle of unconditional academic freedom in the service of the community and the unity of research and teaching in knowledge based institutions
- Scientifically developed knowledge of this kind about professions and professionals’ practices and their broader consequences and requirements is necessary and desirable for the critically reflective development and continuous improvement of professional knowledge, which is in its turn essential to guaranteeing the quality and consistency of professional practice.
- Collective student participation in the selection of academic authorities, content and delivery methods should be guaranteed and
- It is the state’s responsibility to provide and protect the necessary preconditions for the free and open delivery of this education and to guarantee the appropriate conditions for its evaluation and continued further scientific development.

These principles are also reflected in current European Union recommendations for teacher education (e.g. EC 2010) as a means to improve teacher professional competencies and cross-national comparativeness and consistencies in teaching in schools in relation to common, professionally valuable knowledge and skills. They concern the promotion of scientifically founded and independently shared professional values as part of the development of an international tradition and culture of reflective practice that will assist teachers to be autonomous learners who engage in research and develop new knowledge and who are creatively innovative and can take a leading and active part in school development in collaboration with colleagues, parents and others on regional, national and European levels.

Bernstein described the development of this kind of knowledge as a quintessential and defining component of a professional knowledge base in what he termed a Regional Mode of knowledge. This knowledge mode stands in a trilogy of modalities in education together with the generic (vocational) and academic (disciplinary) modes. It represents a form of praxis knowledge that develops when vertical scientific knowledge discourses and their concepts and practices meet horizontal fields of practice and their connotative horizontal forms of
communication in the development of practical know how. Medicine is taken as the prime example of this form of knowledge by Bernstein. In the present paper it is the development of this knowledge base that is under analysis. Sweden is the country that is mainly in focus but what has taken place there is felt able to show some patterns that may also be recognisable elsewhere.

Swedish teacher education reform processes between the Teacher Education Inquiry in 1974 (LUT 74: SOU 1977:1, 1977:2, 1978:86) and the 1997 Teacher Education Commission (LUK 97: SOU 1999:63); and to some degree perhaps even earlier than this (Beach 1995); worked to establish foundations for a regional knowledge base as outlined above as a central part of the education of all teachers and all pre-service teacher education (Carliren 1992, Borg 2007, Eriksson 2009, Beach 2000). These reforms were not fully successful, but neither were they fully unsuccessful (Beach 2000, Eriksson 2009, Kallos 2009), despite the claims of recent reform policies that have abandoned the aims established and appear to be turning back the developments that ensued.

These changes in teacher education reform and the possible interests behind them and their (professional) consequences are in focus in the present paper. They may we feel reflect (or be part of) the rise of the neo-liberal university idea, which tightens up the relationship between education and private economic production and accumulation that is becoming increasingly apparent in higher education policy development, in terms of management and control, together with appeals to neo-conservative subject values (Slaughter and Leslie 1997, Aronowitz 2000) that has been shown to seriously threaten academic independence and the free growth and exchange of knowledge, as well as active student involvement in curriculum development and evaluation (Brule 2004, Slaughter and Rhoades 2004, Beck 2006, Levin 2006, Henkel 2007, Gabrielsen & Saugstad, 2007, Yokoyama 2007, Kolsaker 2008, Zha 2009, Kenny 2009). The about turn in policy is most clearly exemplified in a recent government commission (HUT 07) Green Paper (SOU 2008:109: A sustainable teacher education) and the subsequent government White Paper (Government proposition 2009/10:89) that was based on the recommendations of the commission (Ahlström 2008).

Sweden is a country that in education has been said to have withstood neo-liberalism, at least at a level of material practices, up until fairly recently (Foss et al 2005). However there are now clear examples of this development even there. Four recent government propositions in education give an illustration. As well as Top of the class (Government proposition 2009/10:89) they include Freedom to choose – increased influence by universities on the appointment of university board members (Government proposition 2006/07:43); A boost for research and innovation (Government proposition 2008/09:50); and Freedom and influence - abolition of compulsory student-union membership (Government proposition 2008/09:154). These examples all derive from commissions of inquiry established by the 2006-2010 right wing government and the Green Papers that were written by these commissions.

In the present paper we concentrate our attention mainly on Top of the Class (Proposition 2009/2010:89). In it both the research basis of teaching and learning in educational sciences and the core of professional knowledge for teaching in the common educational core knowledge component termed UVK have been affected (Ahlström 2008). These changes have great significance in a regional knowledge mode as they together contribute to professional praxis content knowledge in the scientific foundation of formal teacher education content. They are effectively being displaced by a Government Proposal that clearly doesn’t regard knowledge about the professional, societal and institutional context of teaching (socially,
sociologically, historically, politically or economically) as of any real significance to the quality of teacher-work (Kallos 2009). It is as if it is regarded as unimportant to provide teachers with an understanding of the social, sociological, political, ideological, cultural and economic landscape in which they and their pupils live, work and learn (Ahlström 2008). Subject knowledge and vocational pedagogical skills are now emphasised as of singular importance (e.g. Proposition 2009/10:89, p 9, p19, p24, p 26, p 41) and the educations are to be profiled in accordance with current school and pre-school practice (e.g. op cit, p 12, p 18, p 25). Teachers are to be economically managed and controlled (Codd 2005, Beach 2008, 2010) and the scientific element of the professional knowledge base is to once again be located inside the subject knowledge domains of university singularities (e.g. physics, history and geography) or their combinations, together with some technical knowledge related to how to deliver/communicate subject knowledge effectively to pupils.

These developments are pushing teacher education away from a scientifically grounded regional knowledge-base for a unified teacher education for all teachers and toward a technical rather than a reflective and organic relationship between knowledge production in for instance university research and the profession (Eriksson 2009) and they may risk turning back the clock of teacher education development to an education arrangement that according to Bernstein (1990) predates the development of the modern university concept and undermines its main principles (Ahlström 2008, Kallos 2009). This is completely against the grain of earlier policy developments and may, in line with for instance Beck (2006), help make professions and professionals and their practices more susceptible to political manipulation and control and economic exploitation (also Codd 2005). Subject knowledge in academic singularities (singular disciplines like physics or history), some basic (mainly practical) knowledge in teaching basic literacy and numeric skills and practical/generic (vocational) teaching experience from teaching practice periods in schools are now being promoted in new propositions as the only essential knowledge for beginning teachers. This is very apparent in proposition 2009/10:89 and the Green Paper preceding it (SOU 2008:109) which, together with the earlier mentioned reforms, weaken academic influence by (i) increasing economic (performance) management, (ii) reducing student influence (except in terms of consumerism and freedom of choice) and (iii) legislating in support of the commercialisation of knowledge and the commodification of learning. This ‘economisation’ of the higher education system makes the role of economic management and business planning central. Academic issues (such as research and teaching content) become subordinate to goals of total quality management and economic productivity. The teacher education curriculum is increasingly influenced and controlled by groups outside of teacher education and educational research.

Why professional knowledge needs a scientific foundation

Bernstein’s (1990) stages of development model for teacher education has been a useful analytical tool in the production of the paper. Here, as also in 1999 (pp 157-159), Bernstein distinguishes between ‘two fundamental forms of discourse’ in relation to university based professional education that reflect a dichotomy between academic- and common-sense knowledge (Beach 2005, Eriksson 2009). The first discourse is a horizontal discourse. This discourse is embedded in everyday language. It both relates to and expresses common sense understandings of on-going everyday social practices and is directed towards immediate practical goals. This common-sense knowledge is likely to be oral, local, context dependent
and specific, tacit and contradictory across but not within contexts according to Bernstein, who suggests also that this knowledge modality is increasingly winning ground with respect to the professional knowledge base of teaching in teacher education.

The second form of discourse is called a vertical discourse. This kind of discourse is developed from the integration of expressions of meaning in a particular specialised field or area to form a coherent, systematically principled and explicit structure that is hierarchically organised and expressed through a specialised language with its own particular syntax and grammar (Bernstein 1996, 170-171). This structure of discourse is found in and characterises the academic and professional disciplines (e.g. physics, mathematics, history and medicine, law respectively) and schools and universities often select content for instruction from these fields of production and act in this way as re-contextualising arenas for the knowledge produced there. Knowledge is sequentially ordered in a curriculum for communication processes and ordered according to a logic of transmission and instruction is oriented toward the production of highly classified texts and practices that are strongly embedded in (and specialised to) particular social and institutional performances.

The difference in the two forms of discourse is important according to Bernstein. Horizontal discourses form and are based on knowledge that is local, tied to a specific practical context and formally less assured and ‘powerful’ than scientific knowledge, in that it is less systematically formed and lacks a vertical (foundational and anchoring) scientific dimension based on specialized inquiry and systematic public evaluation controlled by a professional hierarchy based on an assumed and socially proven and politically legitimated expertise.

This is not insignificant from a policy perspective at the present time as these absences may mean that the knowledge interests of the education can be more easily maneuvered by Governments and more easily influenced through lobbyist activities from powerful interest groups, like national organizations of Trade and Industry for example. Indeed according to researchers such as Beck (2006) the policy formation of a horizontal body of knowledge as the educational basis for a professional field can be understood as part of a move to open up ‘professional development’ to such influences more easily.

Our argument here is not that horizontal knowledge discourses have no value as a basis for professional knowledge of practice (praxis knowledge: Bleakly 2000, Beach 2005). On the contrary there is always tacit knowledge and horizontal communication of this knowledge within a profession, even in an advanced profession such as that of architects (Schön, 1983), and such communication processes and the knowledge carried by them is invaluable and essential (Polyani, 1991). Our point is rather that there is a danger that when such knowledge is in complete ascendancy in the professional knowledge base, both the knowledge to be transmitted and its pedagogy can become segmented, easily displaced and applied discontinuously (with strong local and regional variations) in a manner that contravenes the

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1 This development would be devastating currently in respect of the school and pre-school sector professionals, who are losing their scientific foundation in relation to the professional knowledge base just at a time when private forces are entering fields of practice as owners and controllers of production on a large scale and World wide – not just regionally wide or nationally wide – basis with extremely negative consequences for professional identities, practices and values in the interests of private profit (Codd 2005, Ball 2007, Müller et al 2007, Beach 2008, 2010). This is because horizontal (tacit) knowledge is not related primarily by an integration of meanings through research based scientific analysis of the profession (Ahlström 2008) but through the functional relations of segments or contexts of knowledge to everyday practices, such that what is acquired in one segment or context, and how it is acquired, may bear very little relationship to what is acquired or how it is acquired in another (Bernstein 1999, p160).
idea of a more unified teaching profession with a shared corpus of professional scientific knowledge (Müller et al 2007, Goodson 2008, European Commission 2010) and a common (and even international) professional knowledge foundation. A horizontal discourse on its own gives a very poor foundation from which to develop shared scientifically formed and communicated professional knowledge and skills for reflective praxis. A vertical discourse is needed as well, in the form of a coherent, explicit, and systematically principled and hierarchically organized knowledge structure (as in the natural sciences) that provides a grammar and robust conceptual system (syntax) that can be used to describe, model and theorize from empirical situations in a manner that would help professionals to understand the characteristics, origins, (‘hidden’) aims, interests and effects of suggested and ongoing policy changes sufficiently well to be able to question and if necessary challenge, oppose and modify them for scientifically well founded reasons (Kallos 2009), rather than simply accepting or opposing them on ideological and pragmatic grounds.

Bernstein (1999, p159) describes a structure ‘of specialized languages with specialized modes of interrogation and specialized criteria for the production and circulation of texts’ as an example of the kinds of knowledge and knowledge practices involved, as in the social sciences and humanities and that through the inception and inclusion of educational sciences components in teacher education over the past 40 to 60 years, teacher education was moving in these directions in several European countries (such as England and Wales, Scotland, Sweden, Norway, Finland, Spain and Greece, Müller et al 2007, Hopmann 2001). Unfortunately, as for instance also Garm and Karlsen (2004) suggest, teacher education appears to now be moving toward a more narrow focus upon measurable skills and professional training with less emphasis on broader educational issues. This, together with a focus on outcomes and external control is becoming more dominant, as is eminently clear from the content of the recent White Paper Top of the Class.

Turning the clock both forwards and backwards

Bernstein (1990, p 157) discussed the training of teachers in respect of horizontal and vertical knowledge discourses (or profane and sacred knowledge, after Durkheim) as structurally homologous to the organisation of knowledge in the medieval university in studies toward the priesthood and he used the terms the Trivium and Quadrivium of teacher education with respect to this, to show a dislocation between two different components in this education: firstly a general component concerned with education scientific studies and secondly a component related to individual and relatively independent specific discourses relating to the subject specialisations that students would be expected to teach in schools. The content, forms of communication, relative distributions of and relations between these dislocations have varied over time according to Bernstein, who also identified five chronological stages of development (p 158). The balance in the dislocation and the content of the Trivium are what is currently being changed through Top of the Class. Bernstein’s five stages are:

1. A stage where the same lecturer, usually a former ‘expert teacher’, covered both dislocations in one institution.
2. A stage where lecturers were specialised to one or the other side of the dislocation.
3. A stage where education studies also became constituted in terms of specialised discourses taught by specialists (in e.g. the philosophy, sociology, psychology and history of education).
4. A stage involving the development of a new body of re-contextualised knowledge between the discourses of education studies and those of the individual school subjects that was, Bernstein suggested, in part ‘technical in focus and probably in aspiration’ (p. 158). In e.g. England this re-contextualised knowledge was termed curriculum theory in e.g. Germany, Norway and Sweden it became known as didactics. This new subject became increasingly technified in terms of its relationship to the subject components of the education. In Sweden this is reflected in relation to developments of and in subject didactics (ämnesdidaktik).

5. A stage when the specialised disciplines of educational studies become weakened as ‘political, cultural and academic sites’ (p. 161) in a manner that left psychology as the only remaining education specialisation. This specialisation was taught in combination with subject knowledge and (a now technified) curriculum/didactics studies. It lent the training of teachers to become predominantly technically oriented and led their professional training dimension to be (once again) predominantly conducted in schools guided by experienced teachers.

Stage five is clearly present in several respects with regard to White papers like Proposition 2009/10: 89, but not the least in terms of descriptions of the common knowledge core of teacher education (UVK: UtbildningsVetenskpligKärna) there, as well as the relationship between this core (in quantitative and qualitative terms), and that of subject specialisations and subject didactics. This, in that the common core content is firstly reduced in volume quite dramatically (in fact by up to 20%) compared to other contents in most subject (e.g. natural sciences, languages) and level (e.g. primary, secondary, upper-secondary) combinations and then secondly also arranged horizontally in relation to not less than 16 different thematic areas (from special education to grading and assessment and sustainable development), none of which can because of this be in any way dealt with as specialisations, and most of which can be traced back to initiatives and interests that have developed outside of academia as part of a horizontal discourse (e.g. entrepreneurialism, personal choice, conflict resolution). The door of possibility for this was opened by the Commission of Inquiry behind the Green Paper (SOU 2008:109) preceding the proposition in question (Ahlström 2008).

Through the stage five type developments of proposition 2009/10:89, subject knowledge has once again become the primary (perhaps only) vertically anchoring pillar of the scientific professional knowledge base for subject teachers whilst there is now effectively no such base at all in the other teacher education categories, which have moved closer to a vocational-professional model. Re-traditionalisation is a concept relating to these two parallel developments (Beach 2005). It represents a re-bifurcation of teacher education and the future teaching profession and has the potential to lead to a reaffirmation of the specialized cultural identity of future primary teachers in practitioner-fundamentalist terms in a manner that may even encourage the formation of a conservative and reactionary power against scientific educational/professional knowledge in teacher education (Beach 2005) and a back to basics movement concentrating mainly on teaching discipline and the three Rs. What has been set in motion runs against the grain of earlier policy and is contrary to current recommendations regarding teacher education development in Europe (EC 2010). Teaching has been re-vocationalised and a form of craft-apprenticeship relationship is again a characteristic for the

2 This stage thus moves the professional knowledge base back toward a technical relationship to subjects and weak structures of knowledge (weak grammar, poor insulation, indistinct concepts, local regulation). Bernstein describes it as forming a neo-medieval educational arrangement that allows employers, the media and practitioners a greater say than educational scientists and teaching- and teacher education researchers in what constitutes professional knowledge, skills needs and practices.
development of professional knowledge. In the secondary sector things are equally bad. All you need to know to be a teacher in secondary school according to the White paper 2009/10:89 is the subjects you will teach and knowledge of how to teach them together with the skills, knowledge and courage to be able to grade pupil performances and uphold classroom discipline and order.

Bernstein discusses a traditional craft apprenticeship as the specialized practice nearest to a horizontal discourse and an example of a knowledge structure with weak grammar and tacit transmission. This practical knowledge is, as stated earlier, less systematically structured and organised, more concrete and more distinctly related directly to a specific practical context. Such knowledge is primarily communicated through activities connected to the use and exercise of situational terms, abilities and skills in a way that is also even problematic as a foundation for professional knowledge, as it is directly linked to a material base and an immediate concrete situation that sets particular limitations. The knowledge developed and communicated has difficulty transcending its specific contextual connotative and even economic origins because of this (Carlgren 2003 and Selander 2003) and can be more easily influenced by business and even religious and ideological interests (also Mentor et al 2004, Müller et al 2007, Beach, 1995, 2000, 2005, Goodson 2003, Eriksson 2009).

Secondary/subject teachers may feel they benefit from the new developments as the re-emphasis on subject knowledge as the key scientific knowledge content in their professional knowledge base appears able to provide them with status (through a specialist identity); particularly in relation to other ‘basic’ elementary teachers in the ‘lower-grades’, pre-school teachers and leisure education teachers. However this ‘lift’ may need rethinking, as the move (back) to the subjects actually divorces the scientific element of the knowledge base from educational praxis in schools and will not prepare them well either for understanding pupils from different backgrounds and cultures and their learning needs, differences and interests or for understanding subject history (and politics) and other aspects of the social geography of their profession and the working conditions they will meet in schools. Rather than providing a ‘lift’ of teacher knowledge and status, as is suggested in the Government White Paper itself, the changes may instead leave beginning teachers unprepared for consciously defining, scientifically appraising and where necessary accountably changing their practice in order to improve the learning performances of all learners in rapidly changing circumstances. This is otherwise one of the claimed intentions with the reform, and it may even render them even less able than they are today to control and safeguard the evolution and development of the conditions of labour and employment in schools and other institutions in which they will carry out their professional activities (Beach 2005, 2008, 2010).

**Summing up**

This paper has been about the value of a scientific discourse about the teaching profession and teaching and learning practices in teacher education for teacher work on the one hand and the policy trajectory in Sweden (and to a degree also outside this country) in relation to (and legislating in favour of or against) the conditions necessary for the sustained development, communication and institutional recontextualisation of this discourse on the other. We have suggested that up until quite recently policy development has increasingly favoured the development of conditions of development for a scientific discourse, but also that there has recently been an about turn in this policy and a ‘re-traditionalisation’ of teacher education that
may reflect and be a part of the development of the neoliberal university form. Bernstein’s
distinction between vertical and horizontal discourse has been important to our analysis. This
distinction is closely related to a distinction between esoteric and mundane and sacred and
profane knowledge (also Bernstein 2000, 29-30).

Esoteric knowledge is produced within the ‘scientific’ fraction of the political and cultural
superstructure. It is mediated by theoretical concepts and general principles and has some
partial autonomy from the both the practical, social and material base of production because of
this, in both connotative and economic terms (Beach, 2005). Bernstein describes this
autonomy as the ‘distance’ between a vertical discourse and the ‘real world’. It is often
considered to be a problem by teachers and student teachers (Eriksson 2009, Strömberg
2010), who talk about the problem of coupling the general principles expressed in and by
university content to what teachers do as professionals in the schools they work in (also
Beach, 1995, 2000). However, Bernstein regards this distance as a strength. It is a space in
discourse where room for manoeuvre occurs, where new concepts and principles emerge and
where greater generality can be achieved. According to Bernstein (1999), the discursive
distance is the crucial site of the yet to be thought.

The aim of (the introduction of) a vertical discourse is to provide a critical distance for
educational thinking and analysis from the world of practical action of socially organized
learning in present day schools in class based, hierarchic societies, so we may reflect over the
way aims like integration, authenticity, autonomy and the development of a democratic basis
for learning within a broadened concept of an education for all can be theoretically critiqued
and practically rethought, re-worked and re-enacted in order to be more sustained and
sustainable. It was considered to be essential in the Humboldt concept of the university. As
we suggested earlier, in vertical discourse, the knowledge produced may open upp
possibilities to resist what seem (otherwise) to be policy imperatives by enabling one to
recognise and challenge the values and interests at play there and may therefore be more
powerful – perhaps dangerously powerful Bernstein argues - when compared to horizontal
knowledge. Bernstein further suggests that this is visible in that although the line between
esoteric and mundane knowledge is sometimes unclear and changes over time and between
societies, all societies have clear boundaries and distributive arrangements which regulate
access to the domain of esoteric knowledge and the legitimation of action it allows.

This is less clearly the case with the mundane knowledge contained in, carried by and shaped
through horizontal discourses. Horizontal discourses do not provide access to powerful
systems of meaning and they may make it difficult to select relevant knowledge in unfamiliar
contexts or to engage in the critical enquiry of reflective professionalism (Schön 1983, 1987).
As suggested in Beach (2005), like the prisoners in Plato’s Cave, horizontally communicated
practical discourses can easily leave us severely limited by our everyday experiences,
commonsense understandings and acceptances and predominant media articulations of value
(hegemony) and therefore less able to deconstruct and act against them. This, to us, seems to
be what recent propositions seem to be set on accomplishing, together with the separation of
forms of teacher preparation and teacher work into categories corresponding to divisions in
the school system (pre-school, primary school, middle-school, secondary school, upper-
secondary school and recreation center), which may work in a divide and control fashion.

Building on Bernstein’s analysis, student teachers need access to a vertical discourse because
it can provide them with mechanisms for generating new knowledge beyond specific and
isolated contexts to counter the tendency for horizontal discourses to reduce access to
important forms of knowledge with which to challenge reactionary forms of traditionalism and the status quo. As already stated, this is particularly crucial at present for teacher education for the lower grades of the formal school and nursery education. Following proposition 2009/10:89 these educators will be put to work in a field without a significant scientific element to their professional knowledge base at exactly the same time as they may be becoming more open to political and even economic influence and exploitation through privatisation. This process is sometimes referred to as proletarianisation. It is an aspect of the pacification and control of a profession and has been identified in relation to the teaching profession in a European perspective (Garm and Karlsen 2004, Goodson 2007, Müller et al 2007, Beach 2008, 2010) and elsewhere (e.g. Codd 2005).

Bernstein notes that the interests that help constitute the horizontal discourses that act on vocational knowledge are often constructed and distributed outside of and even independently of universities as pedagogic re-contextualizing fields (Ahlström 2008, Kallos 2009). This is against the unity of teaching and research in the modern concept of the university and may be linked to instrumentalities of the market and things like on the job training, practice modelling and mimetic learning that are developing rapidly as commercially sold commodities at present (often with help from media political plays on emotions and fears about (un)employability). These generic modules are generally developed around so-called key and core skills that are abstracted from specific occupations or fields of study on the basis of similarity and are marketed through various private consultancy services, even if also some institutions of higher education are developing regional knowledge and training centres and institutes to compete on these markets. This is particularly evident in later developments in knowledge economies (Bernstein, 1996), which openly embrace the saleable concept of trainability as a commodity product and recommend a strengthened employer voice that is fully demand-led and focused on practical vocational skills. In line with Bernstein, through them weak grammars and tacit transmission are likely to become more characteristic for professional knowledge in the future than they are today. And this is exactly what can be seen we suggest in the most recent national teacher education proposition in Sweden Top of the Class (Proposition 2009/10:89).

Vocational training was the fundamental pedagogic objective of the phase of teacher education prior to stage one as described by Bernstein’s model (1990), but it is also what phase 5 developments seem able to amount to when they are analysed critically. This is highly problematic for professional knowledge. Professional development is turned backwards against aims of critical reflection and analysis that were endorsed until recently in most advanced knowledge-based societies, toward generic modes that are constructed from relations of similarity between elements of different practices that have been abstracted from their original contexts in a way that silences their cultural bias (Beach 2005).

Current policies clearly legislate and legitimate the vocationalisation of teacher education (Garm and Karlsen 2004) and the transformation of the teacher role into one of a managed professional (Codd 2005). But if the ambition is to develop a teacher education that is both critical and reflective politicians and policy-makers at national and European levels may need to consider wholeheartedly rejecting this development in favour of an education with a strong conceptual structure (syntax and grammar) and a highly developed vertical discourse: i.e. a regional knowledge base.

In Sweden the previous teacher education reform from proposition 1999/2000:135, and particularly the Green Paper preceding it, aimed to continue a move in these directions that
had been set in motion by earlier reforms, as did similar propositions appearing in other European countries like Finland and Ireland (Houtsonen et al 2010) and Spain, Portugal and Greece from the seventies to the nineties (Müller et al 2007).

Recent reforms go the opposite way. There is now no recognition of the value of the scientific study of education and education systems for the development of professional knowledge at the policy level and a vocational model has once again become predominant in a manner that creates a vacant intellectual space around practice ‘waiting to be filled with whatever temporary contents the market, or institutional, or governmental imperatives may dictate’ (Beck 2006, 193). This is clear in for instance Sweden and Norway at the present time (Garm and Karlsen 2004, Ahlström 2008, Kallos 2009) and it filters down to the subjective level of teacher consciousness (Houtsonen et al 2010). One exception to this may be Finland (ibid).

**Conclusions: Some principles for high quality teacher education**

In line with our analysis we suggest the following standards may be important for developing and then sustaining teacher education of a high critical, reflective intellectual standing:

- The aims and standards of delivery of teacher education should be regulated by academically qualified research knowledgeable State certified and monitored bureaucrat-experts with the specific charge to guarantee the preconditions for a high quality research based education, with clearly demarcated shared and distinctly communicated scientific aims and standards. This implies a strong but not overpowering State bureaucracy of professionally and scientifically educated administrators, researchers, policy analysts, policy developers and evaluators who together create preconditions for the design, development, delivery and monitoring of a scientifically-based professional education (Beach 1995). This State bureaucracy could be on a regional, national or European level and its development is in line with those in professions like Medicine and Law. It is very much in keeping with a modern conception of the Humboldt university ideal when it becomes applied to professional knowledge and combines a relatively high level of partial autonomy with clear directives as to what counts as necessary teacher knowledge and why (Bernstein 1990, 1996). It means that

- National higher education institutions (universities, polytechnics and university colleges of education) carry out teacher education according to stipulated aims but are relatively free to do so according to institutionally determined and monitored courses that are communicated through curricula and syllabi that describe content, ethos, aims, objectives and forms of teaching, learning and evaluation. This would help to guarantee that teacher education would

- Uphold the values and principles of a professionally relevant scientifically based education with a highly developed regional mode of professional knowledge that can operate as a means for the State to regulate and develop national schools according to a scientific language and practices (concepts and grammar) that is acknowledged and understood, if not always flatly shared, by all teachers and can be internationally coordinated and analytically compared. This was in accordance with university statutes and ordinances in most knowledge-based societies up until recently and reflects a historical commitment toward democratic, scientific and comprehensive
university education in a common core professional knowledge base containing a significant educational studies component for would be teachers.

- Institutions providing this education would make expedient use of the total range of scientific competence available (including student competences) and would also cooperate emphatically with the surrounding community and its schools, education authorities and learning organisations in civic society, trade and industry locally, regionally, nationally and internationally.

A highly developed regional knowledge base doesn’t mean ignoring academic subjects or denying them value. Teacher education institutions of high quality have normally included a highly challenging subject curriculum (including subject didactics) alongside their theoretical professional-knowledge base content area (Educational Science). But in balance! As stated earlier current policies are tipping this balance. Teacher education institutions offering a high quality programme should, we suggest recognise the threat of this ‘tip in the balance’ and respond by reasserting the value of professional knowledge to prepare students for further professional studies up to researcher education levels in order to guarantee continued professional development for both individual teachers and professional collectives. Two further criteria can be recognised here. These are firstly an extremely strong research culture that is highly relevant for the development of the professional knowledge base and the profession and a majority of staff who are research active and who regularly publish research papers in high quality peer reviewed journals. They are secondly a symbiotic relationship between research and the teaching of education studies in relation to this. This reflects the principle of the unity of teaching and research in the Humboldt university concept. Perhaps the reluctance to emphasise scientific knowledge of education is because, as Bernstein (1990, 1996) suggested, that this knowledge could be disruptive toward and dangerous for the new shift in emphasis in much national policy toward neo-liberal ideas, aims, interests and changes in education and society.

References (incomplete)


CONDITIONS FOR STUDENT TEACHER PROFESSIONAL DEVELOPMENT

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Abstract
The rapidly changing nature of Europe and of education and culture that includes conditions for student teacher professional development is generated by the democracy transition from opportunity to choose towards qualities and purposes that resonates with the potential for personal and social emancipation in the context of cultural and educational globalization. Conditions of contribution applied to enhance student teachers’ professional development become particularly important for the development of education and culture change in the constantly changing environment.

Student teacher professional development is based on conditions. However, the success of conditions for student teacher professional development requires English for Academic Purposes studies for student teacher professional development to be considered. The purpose of the following contribution is to identify and to analyze conditions for student teacher professional development within a multicultural environment. The meaning of the key concepts of professional development and English for Academic Purposes studies is studied within the search for conditions. Moreover, the study demonstrates how the key concepts are related to the idea of conditions for development. The findings of the research reveal the conditions, namely, developing the system of the external and internal perspectives, student teacher interaction with teacher trainer and scientific and professional concepts, and student teacher interaction with peers and quasi-concepts, learning and reflection that contribute to student teacher professional development.

Key words: Teacher Education, Student Teachers, Professional Development, Conditions for Development, English for Academic Purposes studies

1. Introduction
The rapidly changing nature of Europe and of education and culture that includes conditions for student teacher professional development is generated by the democracy transition from opportunity to choose towards qualities and purposes that resonates with the potential for personal and social emancipation in the context of cultural and educational globalization. Conditions of contribution applied to enhance student teachers’ professional development become particularly important for the development of education and culture change in the constantly changing environment.

Student teacher professional development is based on conditions. However, the success of conditions for student teacher professional development requires English for Academic Purposes studies for student teacher professional development to be considered. The purpose of the following contribution is to identify and to analyze conditions for student teacher professional development within a multicultural environment. The meaning of the key concepts of professional development and English for Academic Purposes studies is studied within the search for conditions. Moreover, the study demonstrates how the key concepts are related to the idea of conditions for development. The paper is organized as follows: Section 2 introduces the theoretical framework with the emphasis on conditions for student teacher professional
development within teacher education. Research design is revealed in Section 3. The associated empirical results are presented and interpreted in Section 4. Finally, some concluding remarks and hypothesis for further studies are elaborated in Section 5.

2. Theoretical Framework

2.1. State-of-the-Art

The modern issues of global developmental trends emphasize “a prime importance in sustainable development that is to meet the needs of the present without compromising the ability of future generations to meet their own needs” (Zimmermann, 2003, p. 9). Thus, sustainable personality, and, consequently, student teacher, is “a person who sees relationships and inter-relationships between nature, society and the economy” (Rohweder, 2007, p. 24). In other words, this is a person who is able to develop the system of external and internal perspectives, and in turn the system of external and internal perspectives becomes a main condition for the sustainable student teacher to develop. For instance, the concern of the European Union, namely, to become “the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion” (European Commission, 2004, p. 2), demonstrates the significance of developing the system of external and internal perspectives for the development of humans, institutions and society. Thus, the life necessity to develop the system of two perspectives, namely, external and internal, determines the research methodology on conditions for student teacher professional development, as highlighted in Figure 1 introduced by Ahrens and Zaščerinska (Ahrens, Zaščerinska, 2010, p. 180).

![Figure 1: Developing the system of external and internal perspectives as a life necessity](image-url)

However, in real life sustainable student teacher is often realized from one of the perspectives (Surikova, 2007, p. 254):
- from the internal perspective accentuating cognition,
- from the external perspective accentuating social interaction and
- finding a balance between the external and internal perspectives.

The methodological foundation of the present research on conditions for student teacher professional development is formed by the System-Constructivist Theory based on Parson’s system theory (Parson, 1976) where any activity is a system, Luhmann’s theory (Luhmann, 1988) which emphasizes communication as a system, the theory of symbolic interactionalism (Mead, 1973; Goffman, 2008) and the theory of subjectivism (Groeben, 1986). The application
of this approach to learning introduced by Reich (Reich, 2005) emphasizes that human being’s point of view depends on the subjective aspect (Maslo, 2007, p. 43):
- everyone has his/her own system of external and internal perspectives (Figure 1) that is a complex open system (Rudzinska, 2008, p. 366), and
- experience plays the central role in a construction process (Maslo, 2007, p. 39).
Thus, four approaches to conditions for student teacher professional development are revealed, namely,
- from the internal perspective accentuating cognition,
- from the external perspective accentuating social interaction,
- finding a balance between the external and internal perspectives and
- developing the system of external and internal perspectives.
Therein, the fourth approach, namely, developing the system of external and internal perspectives, is considered to be applicable to the present research on conditions for student teacher professional development.

2.2. Student Teacher Professional Development
The present research emphasizes that individual development involves professional development as highlighted in Figure 2.

![Figure 2: The relationships between individual and professional development](image)

Professional development in pedagogy is a qualitative change taking place in the professional involving process, growth, expansion, and striving for perfection in his/her professional activity, with regard to the conditions, opportunities, and needs of society, and the situation of the profession (Kacapa, 1999, p. 26). Moreover, not all development is equally valuable: for example, a perspective that focuses solely on the individual learner may lose sight of the common (social and/or professional in the context of the present research) perspective that insists on a specific direction of development and problem solving (Aase, 2006, p. 3). Student teacher professional development comprises competence development (Maslo, 2006c, p. 50).
Student teacher professional development is based on conditions.

2.3 Conditions for Student Teacher Professional Development
Condition is the development of psychological processes for experience improvement (I. Žogla, 1997, p. 10).
Conditions comprise intrapersonal, interpersonal and introspective processes (Maslo, 2006a, p. 14), thereby developing the system of external and internal perspectives.
Conditions as the intrapersonal and interpersonal processes put the emphasis on the uniqueness of personality (Maslo, 2006b, p. 20) and reflection for becoming professional (Kepalaite, 2008, p. 83). The intrapersonal process reveals cyclic nature of development (Maslo, 2006b, p. 23) that emphasizes that theoretical findings focused on children are equally applicable to adult
development: “Vygotsky’s work focused on children, yet, his instructional insights (teaching in the frame of the present research) are equally applicable to adult learning” (Benson, 1995, p.7).

Conditions as integrative introspective processes lead to understanding that learning is already a process of learner’s development (Žogla, 2008, p. 31). In other words, professional development proceeds if only professional learning takes part. Thus, professional learning is a possibility for professional development. All learning is part of a single process, an on-going process (Maslo, 2007, p. 38). This finding suggests that professional learning is part of a single learning process within the professional development. Moreover, continuing professional development is regarded as lifelong learning (European Commission, 2004, p. 53) that includes formal learning, non-formal learning and informal learning.

Conditions for student teacher professional development are formed by student interaction in foreign language and professional language defined as native language for specific purposes (Zaščerinska, 2010b, p. 406), and in foreign language for professional purposes (Zaščerinska, 2009a, p. 147) and on the types of relationships between spontaneous concept and mother tongue, between scientific concept and foreign language, between spontaneous and scientific concepts and/or mother tongue and foreign language (Vigotskis, 2002, p. 203-269). Student interaction comprises the following forms: interaction with teacher trainer and scientific and professional concepts as well as interaction with peers and quasi-concepts. Hence, developing the system of external and internal perspectives, student teacher interaction with teacher trainer and scientific and professional concepts, student teacher interaction with peers and quasi-concepts, learning and reflection are the conditions for student teacher professional development.

The theoretical analysis of the present research reveals that the emphasis of student teacher professional development is put on interaction in foreign language for professional purposes, namely, English for Academic Purposes studies, in diverse open professional problem situations based on the principles of mutual sustainability, complementarity and reflexivity as described in Table 1 by Zaščerinska (Zaščerinska, 2010a, p. 400).

### Table 1

| Conditions for student teacher professional development in the socio-cultural context |
|---------------------------------|---------------------------------|---------------------------------|
|                                 | Efficient professional environment |                                 |
|                                 | External perspective | Internal perspective |
| Opportunities to construct experience in social interaction | | |
| Mastering constructive strategies and techniques of social interaction and its use in real life | Opportunities to construct experience in cognitive activity | Mastering constructive strategies and techniques of cognition and its use in real life |
| Interpersonal dialogue | Study cultural dialogue | Individual’s internal dialogue |
| Object-regulation | Other-regulation | Self-regulation |
| Establishing social purposes, social interaction planning and organizing | Establishing joint purposes, collaboration planning and organizing | Establishing personal purposes, individual planning and organizing |
| Social decision making | Joint decision making | Individual decision making |
| External evaluation | Mutual evaluation and self-evaluation | self-evaluation |
3. Research design

3.1. The research purpose and questions

The present research was conducted during the implementation of English for Academic Purposes studies in the English for Academic Purposes course within the master programmes School Management, Pedagogy and Music Pedagogy of Riga Teacher Training and Educational Management Academy in 2006-2007 to reveal the view of student teachers, educators and researchers on English for Academic Purposes studies for the development of students’ communicative competence as student teachers’ professional development in order to promote the quality of studies. Its topicality is determined by ever-increasing flow of information in which an important role is laid to communicative competence to get information and gain experience. The research question is as follows: what is the view of student teachers, educators and researchers on purposes of use of English for Academic Purposes studies for the development of students’ communicative competence as student teachers professional development?

3.2. Description of the implementation of the English for Academic Purposes course in the Masters’ programmes

The two-year master studies are aimed at facilitating students’ research success, supporting preparation for international Ph.D. programmes in the European Union, further specializing in the chosen field and learning in a simulated environment. A graduate has the opportunity to continue to study in the doctoral study programme. The aim of the English for Academic Purposes course in the two-year masters’ programmes is to improve student teachers’ communicative competence in English for Academic Purposes as student teachers’ professional development for the participation in international research activities. English for Academic Purposes studies involve various forms and/or teaching/learning techniques and/or activities, namely, discussion, prepared talk, communication games and information-gap activities (Zaščerinska, 2009b) to promote student teachers’ communicative competence in English for Academic Purposes as student teachers’ professional development.

3.3. The respondents of the research

The empirical study comprised three researchers, five language educators, 75 master students of Riga Teacher Training and Educational Management Academy in October – December 2006, namely,
- 26 students of the first year within the professional master’s study programme School Management,
- 19 students of the second year within the professional master’s study programme School Management and
- 30 students of the professional master’s study programme Music Pedagogy and
10 first-year master students within the professional master’s study programme School Management at Riga Teacher Training and Educational Management Academy in September 2007.

The samples with different upbringing backgrounds and with diverse educational approaches (A. Gulbe, 2008, p. 79) were selected. 60 of the students had certain expectations from the master programmes and, consequently, from the English for Academic Purposes course, which were demonstrated in the answer to the question why they had chosen this programme. The students’
communicative competence in English for Academic Purposes as student teachers’ professional
development in the studies was one of the answers.

3. 4. Research methodology
This study is oriented towards the revealing of the view of student teachers, educators and
researchers on English for Academic Purposes studies for the development of students’
communicative competence as student teachers’ professional development in order to promote
the quality of studies in teacher education.
The view of student teachers, educators and researchers on English for Academic Purposes
studies for the development of students’ communicative competence as student teachers’
professional development is considered through purposes of use of English for Academic
Purposes studies to be of three levels, namely, for
  • individual purposes,
  • organizational purposes and
  • professional (and academic in the present research) purposes.
An explorative research has been used in the research (A. Tashakkori, C. Teddlie, 2003). The
study consisted of the following stages: exploration of the view of student teachers, educators
and researchers on English for Academic Purposes studies for the development of students’
communicative competence as student teachers’ professional development in Latvia, data
processing, analysis and data interpretation, analysis of the results and elaboration of conclusions
and hypothesis for further studies.

4. Findings of the research
4.1 Student teachers’ view on English for Academic Purposes studies for students’
communicative competence as student teachers professional development
The view of student teachers as prospective specialists on English for Academic Purposes studies
contributes decisively to the development of student teachers’ communicative competence as
student teachers’ professional development in teacher education.
Analysis of the student teachers’ view on English for Academic Purposes studies for the
development of student teachers’ communicative competence as student teachers’ professional
development at Riga Teacher Training and Educational Management Academy from September
2006 to September 2007 comprised three phases, namely,
  - the structured interviews involved a group of five students of the second year within the
    professional master’s study programme School Management of Riga Teacher Training
    and Educational Management Academy from September 2006 to October 2006,
  - the questionnaire filled in by 75 master students of Riga Teacher Training and
    Educational Management Academy was analyzed from October 2006 to December 2006,
  - 10 first-year master students within the professional master’s study programme School
    Management at Riga Teacher Training and Educational Management Academy in
    September 2007 were interviewed.
In order to provide data reliability and validity the use of mixed methods is implemented in the
present study, namely, the qualitative interviews are supplemented with a quantitative survey.
Interviews allow for a more in-depth exploration of issues than is possible with a questionnaire,
though they take longer to administer and are only feasible for smaller groups (J. C. Richards,
2001, p. 61). Moreover, an interview may often be useful at the preliminary stage of designing a
questionnaire, since it will help the designer get a sense of what topics and issues can be focused
on in the questionnaire (J. C. Richards, 2001, p. 61). An emphasis of analysis of the student teachers’ view on English for Academic Purposes studies for the development of students’ communicative competence as student teachers’ professional development was put on the structured interview in which a set of series of questions is used. These questions of the structured interview are usually based on the previous theoretical analysis (A. Kroplijs, M. Raščevska, 2004, p. 99). The structured interview allows more consistency across responses to be obtained (J. C. Richards, 2001, p. 61). The structured interviews comprised three questions, namely,

1. Why study English for Academic Purposes?
2. What are your interests in English for Academic Purposes?
3. What are your achievements in English for Academic Purposes by the end of the course?

The first phase of the analysis of the student teachers’ view on English for Academic Purposes studies for the development of students’ communicative competence as student teachers’ professional development from September 2006 to October 2006 involved a group of five students of the second year within the professional master’s study programme School Management of Riga Teacher Training and Educational Management Academy to conduct the structured interviews. The aim of the interviews was to reveal the students’ point of view on English for Academic Purposes studies for the development of students’ communicative competence as student teachers’ professional development.

For example, Respondent NAS1 emphasized English for Academic Purposes to be an international language. The student’s interests in English for Academic Purposes included talk and presentation. Preparation of two presentations, namely, about the native place and a successful researcher, was stressed as the achievements in English for Academic Purposes by the end of the course. Whereas Respondent NAS4 revealed English for Academic Purposes to be used in future jobs for searching for information and talking with colleagues from other countries. Problem solving and research were outlined as the student’s interests in English for Academic Purposes studies. The student’s achievements in English for Academic Purposes studies by the end of the course comprised two presentations, namely, about the native country and a scientist.

The structured interviews revealed that the students’ point of view on English for Academic Purposes studies for the development of students’ communicative competence as student teachers professional development was heterogeneous as well as the students did not realize the purposes of English for Academic Purposes studies properly.

The second phase from October 2006 to December 2006 involved 75 master students of Riga Teacher Training and Educational Management Academy. The aim of the present phase was to reveal a detailed information about the student teachers’ point of view on the purposes of English for Academic Purposes studies for the development of students’ communicative competence as student teachers’ professional development. The questionnaire based on a set of structured items in which the respondent chooses from a limited number of responses (J. C. Richards, 2001, p. 60) was used to elicit information about the purposes of the frequent use of English for Academic Purposes studies from the students’ point of view:
1. I need to interact with other people for my individual purposes.
2. I need to learn for my individual needs.
3. I want to interact with other people for my individual purposes.
4. I want to learn for my individual purposes.
5. I lack interaction with other people for my individual purposes.
6. I lack learning for my individual purposes.
7. I expect myself to interact with other people for my individual purposes.
8. I expect myself to learn for my individual purposes.
9. I need to interact with other people for my organization’s purposes.
10. I need to learn for my organization’s needs.
11. I want to interact with other people for my organization’s purposes.
12. I want to learn for my organization’s purposes.
13. I lack interaction with other people for my organization’s purposes.
15. I expect myself to interact with other people for my organization’s purposes.
16. I expect myself to learn for my organization’s purposes.
17. I need to interact with other people for my professional purposes.
18. I need to learn for my professional needs.
19. I want to interact with other people for my professional purposes.
20. I want to learn for my professional purposes.
21. I lack interaction with other people for my professional purposes.
22. I lack learning for my professional purposes.
23. I expect myself to interact with other people for my professional purposes.
24. I expect myself to learn for my professional purposes.

The questionnaire comprised the evaluation scale of five levels for each question, namely, “1” means “disagree” and “6” points out “agree”.

The use of the Cronbach’s Alpha test emphasized that the coefficient of reliability is 0.848 highlighting a high level of reliability of the present questionnaire. Moreover, the corrected item-total correlation greater than 0.3 includes a question into the questionnaire. The item-total statistics test excluded three questions from the questionnaire, namely, expectation to interact with other people for the individual purposes (-1.63), need to learn for the organization’s purposes (-.330), and wish to interact with other people for the organization’s purposes (.133).

Frequencies were determined to reveal the purposes the students had used English for Academic Purposes studies for most frequently. The survey showed that the students had used English for Academic Purposes studies most frequently for their individual purposes putting the emphasis on the lack of interaction with other people for the individual purposes (63 responses).

The survey emphasized that the use of English for Academic Purposes studies by the students is heterogeneous as well as the students did not realize the purposes of English for Academic Purposes studies properly. Analysis of the questionnaire based on a set of structured items allows drawing the conclusion that the individual purposes in use of English for Academic Purposes studies were emphasized by the student teachers while English for Academic Purposes studies are focused on professional purposes.

The third phase of the analysis of the view of student teachers on English for Academic Purposes studies for the development of students’ communicative competence as student teachers’ professional development involved the sample of 10 first-year master students within the professional master’s study programme School Management of Riga Teacher Training and Educational Management Academy in September 2007 to conduct the structured interviews. The structured interviews to analyze the students’ point of view on purposes of English for Academic Purposes studies for the development of students’ communicative competence as student teachers’ professional development comprised three questions, namely,

1. Why study English for Academic Purposes?
2. What are your interests in English for Academic Purposes?
3. What are your achievements in English for Academic Purposes by the end of the course?

For example, Student F1 joined the English for Academic Purposes course because English is the most popular language. The student determined the interests in English as presentation skills and small talk. Achievements within English for Academic Purposes studies were considered as improved presentation skills. Whereas Student F6 put the emphasis on English as an international language and the main language of the chosen profession. The student’s interests in English for Academic Purposes focused on gaining more experience (practice) in English language, namely, speaking, writing and etc. Improved English skills and creation of a presentation were determined by the student as the achievements by the end of the English for Academic Purpose course.

It has to be marked that in the year 2007 there were no specific requirements as to level of the communicative competence to study in the respective English for Academic Purposes course of the professional masters’ study programmes School Management and Music Pedagogy of Riga Teacher Training and Educational Management Academy.

The analysis of the structured interviews revealed that the emphasis is put on the individual purposes in use of English for Academic Purposes studies by the student teachers while English for Academic Purposes studies for the development of students’ communicative competence as student teacher professional development are focused on professional purposes. This is a reason why a support system to contribute to the student teachers’ professional development in a plurilingual study context was elaborated. This support system differs from the one offered in the English for Academic Purposes course by other English educators.

4.2 Educators’ view on English for Academic Purposes studies for students’ communicative competence as student teachers professional development

Analysis of educators’ view comprised five respondents of Riga Teacher Training and Educational Management Academy in 2006.

An emphasis of the analysis of the educators’ view on English for Academic Purposes studies for the development of students’ communicative competence as student teacher professional development was put on the semi-structured interview. The semi-structured interview is used when the knowledge of the research field has been obtained by the researcher (A. Kroplijs, M. Raščevka, 2004, p. 99). The semi-structured interviews to analyze educators’ view on English for Academic Purposes studies for the development of students’ communicative competence as student teacher professional development comprised one question, namely, what is the educator’s view on purposes of use of English for Academic Purposes studies for the development of students’ communicative competence as student teacher professional development.

For example, Respondent NAEMP revealed the aim of the English for Academic Purposes course within the professional master’s study programme Music Pedagogy of Riga Teacher Training and Educational Management Academy to be oriented towards fostering students’ competency, which includes students’ communicative competence. The exposure of the students’ communicative competence could comprise the implementation of the acquired academic content in native language, professional language and foreign languages (English, German and others). The respondent put the emphasize on the number of students in the foreign language classroom considering that the fewer students are in the foreign language classes, the more attention the educator is able to pay to each learner, as a result the learning outcomes improve.
Whereas Respondent *NAELP1* highlighted the *English for Academic Purposes* course to tend to the students’ preparation for international Ph.D. programs in the European Union, students’ further specialization in the chosen profession and learning in a simulated environment. The respondent emphasized the *English for Academic Purposes* course to be aimed at fostering a foreign language as a language of instruction in the studies. According to the respondent, the level of the students’ competence could reach the levels of independent users and proficient users by the end of the *English for Academic Purposes* course. This competence level (B1, B2, and C1) could enable the students to read professional texts in English and to use English as a means for studying other courses/subjects.

The analysis of the semi-structured interviews with the emphasis on the educators’ point of view on purposes of use of English for Academic Purposes studies for the development of students’ communicative competence as student teacher professional development revealed that the emphasis on the individual and organizational purposes from the educators’ point of view prevails in use of English for Academic Purposes studies while English for Academic Purposes studies are focused on the professional purposes.

Thus, by providing pedagogical support to the students and using the communicative competence in mastering academic content (teaching-learning aids in an understandable language, consultancy, for collaborative work) students with different cognitive abilities transfer language knowledge from one language to another.

### 4.3 Researchers’ view on English for Academic Purposes studies for students’ communicative competence as student teachers professional development

Analysis of researchers’ view comprises three respondents of Riga Teacher Training and Educational Management Academy in 2006.

An emphasis of the analysis of the researchers’ view on English for Academic Purposes studies for the development of students’ communicative competence as student teacher professional development was put on the non-structured interview. The non-structured interview is used to search for the main categories of the research field (A. Kroplijs, M. Raščevka, 2004, p. 98). The non-structured interviews to analyze researchers’ view on English for Academic Purposes studies for the development of students’ communicative competence as student teacher professional development comprised one question, namely, what the researcher’s point of view on English for Academic Purposes studies for the development of students’ communicative competence as student teacher professional development is.

For example, Respondent *NARLP* suggested the system of language module for the development of the students’ communicative competence within the English for Academic Purposes studies. The language module should be based on students’ workload corresponded to the ECTS-system. The language module is part of the study courses within the professional masters’ study programmes *School Management*, *Pedagogy* and *Music Pedagogy* of Riga Teacher Training and Educational Management Academy. The language module could be available for continuous education programs and inhouse seminars for companies as well.

The analysis of the non-structured interviews with the emphasis on the researchers’ point of view on English for Academic Purposes studies for the development of students’ communicative competence as student teacher professional development revealed that the emphasis on the professional (and academic in the present research) purposes from the researchers’ point of view prevails in use of English for Academic Purposes studies for the development of students’ communicative competence as student teacher professional development that corresponds to the focus of English for Academic Purposes studies.
Thus, pedagogical support to the students and using the communicative competence in mastering academic content provides transfer of knowledge from one discipline to another by the students with different cognitive abilities.

5. Conclusions and hypothesis for further studies

The findings of the present research allow drawing conclusions on the heterogeneous views of student teachers, educators and researchers on English for Academic Purposes studies for the development of students’ communicative competence as student teacher professional development.

Thus in order to help student teachers widen their learning experience in English for Academic Purposes studies for the development of communicative competence as student teacher professional development it is vital to organize a support system based on developing the system of external and internal perspectives, student teacher interaction with teacher trainer and scientific and professional concepts, and student teacher interaction with peers and quasi-concepts, learning and reflection that would favour student teachers’ learning for dealing with the communicative competence in the English for Academic Purposes and other courses.

The present research has limitations. The view of student teachers, educators and researchers on English for Academic Purposes studies for the development of students’ communicative competence as student teachers’ professional development was studied paying attention to the view of students, educators and researchers of one tertiary institution. The results of the introductory part of the English for Academic Purposes course were analyzed but the full length of the English for Academic Purposes course involves two semesters. If the results of the whole course had been available for analysis, different results could have been attained. There is a possibility to continue the study.

The following hypothesis for further studies is put forth: in order to develop the student teachers’ communicative competence as student teacher professional development it is necessary to elaborate a support system in multicultural environment with the emphasis on English for Academic Purposes studies that promote student teachers’ successful use of the communicative competence as student teacher professional development and provides student teachers with personal experience for professional purposes as conditions for creation of new knowledge and learning outcomes.

References


Designing a Qualitative Research for Evaluation of English for Academic Purposes Activity in Teacher Education

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Competence-based teacher education provides new knowledge within the knowledge triangle of education, research and innovation. Communicative competence is of the greatest importance of the eight key competences which individuals need for personal fulfilment and development, active citizenship, social inclusion and employment (European Commission Directorate-General for Education and Culture, 2004, p. 2). The success of teachers’ communicative competence requires a qualitative research for evaluation of English for Academic Purposes activity in teacher education to be considered. Aim of the following paper is to identify a qualitative research design to evaluate efficiency of English for Academic Purposes activity in teacher education. The study presents how the steps of the process are related: defining the design of qualitative evaluation research → revealing the principles of qualitative evaluation research → designing the methodology of a qualitative evaluation research → determining the methods of qualitative evaluation research → empirical study within a multicultural environment. The findings of the research offer the qualitative evaluation research design to evaluate efficiency of English for Academic Purposes activity in teacher education for the improvement of student teachers’ communicative competence.

Key words: Teacher Education, Student Teachers, Qualitative Evaluation Research Design, Communicative Competence, English for Academic Purposes Activity

1. Introduction

Competence-based teacher education provides new knowledge within the knowledge triangle of education, research and innovation. The success of teachers’ communicative competence requires a qualitative research for evaluation of English for Academic Purposes activity in teacher education to be considered. Aim of the following paper is to identify a qualitative research design to evaluate efficiency of English for Academic Purposes activity in teacher education.

The goal of the qualitative evaluation research is aimed at the detailed descriptions or evaluations of current practice (U. Flick, 2004a, p. 149), namely, to check the effectiveness, efficiency and goal-attainment of programmes, measures, models and laws, of pedagogic interventions and organizational changes in complex and constantly self-regenerating environments (E. Kardoff, 2004, p. 137). The search for the discovery of social reality, for trying its capacity for change, for testing its boundaries (E. Kardoff, 2004, p. 142), for making visible both the necessary and the obstructive mechanisms in changing and redefining social constructions (U. Flick, E. Kardoff and I. Steinke, 2004, p. 66) reveals the paradigm shift in the development of qualitative evaluation research from the assessment of results and goals with reference to the relevant environment to the qualitative process-oriented procedure. Kardoff (E. Kardoff, 2004, p. 139-141) includes the following components of the qualitative evaluation research design: background assumptions, principles and theoretical perspectives, methodological principles, methods, interpretation and validation and presentation of results.

The paper is organized as follows: Section 2 introduces the theoretical framework with the emphasis on the qualitative evaluation research design to evaluate efficiency of English for Academic Purposes activity in teacher education for the improvement of student teachers’ communicative competence. Research design is revealed in Section 3. The associated empirical results are presented and interpreted in Section 4. Finally, some concluding remarks and hypothesis for further studies are elaborated in Section 5.
2. Theoretical Framework

2.1 Principles of Qualitative Evaluation Research Design

The present design of qualitative evaluation research comprises interpretative research paradigm determined both by the researcher’s practical interests, namely, English for Academic Purposes activity to develop the system of external and internal perspectives, and the correspondence of social constructivism theory, symbolic interactionism theory and action and activity theories to the given paradigm (I. Lūka, 2007, p. 104). Interpretative research paradigm which corresponds to the nature of humanistic pedagogy creates an environment for the development of any individual and helps them to develop their potential (I. Lūka, 2008, p. 52) whereas researcher is an interpreter. The core of this paradigm is human experience, people’s mutual everyday interaction that tends to understand the subjectivity of human experience as well as the paradigm is oriented towards one’s conscious activity, thus it is future-oriented (I. Lūka, 2007, p. 104): its aim is to understand people’s activity, how a certain activity is exposed in a certain environment, time, conditions, i.e., how it is exposed in a definite socio-cultural context. The researcher’s close contact and interaction with the people involved in the study is an advantage in obtaining the research results (I. Lūka, 2007, p. 112).

2.2 Methodology of Qualitative Evaluation Research Design

The paradigm shift from the goal assessment-oriented approach to the qualitative process-oriented procedure (E. Kardoff, 2004, p. 138-139) puts the emphasis on the methodological procedures of the qualitative evaluation research design.

Analysis of the qualitative evaluation research designs within the promotion theses in pedagogy worked out in Latvia, namely, Development of adolescents social culture competence within the second foreign language studies (I. Tiļļa, 2003) and Mentor’s assistance to teachers’ team implementing bilingual education (Ž. Akopova, 2004) emphasizes three following phases of the qualitative evaluation research design:

- preparing the research characterized by defining the research problem, determining the research hypothesis, creation of the theoretical model, sampling and exploration of the context of the macro-, mezzo- and micro-levels,
- carrying out the research determined by surveys, implementing the model and examining the hypothesis and
- the research results realized in data processing and analysis, expert evaluation and determining opportunities for further research.

Validity and reliability of results of the qualitative evaluation research may be validated by

- involving other researchers into the study (M. Freeman, K. deMarrais et. al., 2007) in several stages of the conducted research,
- generalization aimed at the development of general statements, hypothesis, which can be tested for generality in following studies with different people in different times by the use of explorative study (P. Mayring, 2007, p. 4),
- international co-operation (I. Žogla, A. Lasmanis, 2010, p. 280), namely,
  o working out a PhD thesis in co-operation with international colleagues and PhD thesis assessment by international colleagues on the basis of co-operation between universities,
  o PhD students’ participation in doctoral workshops given by international colleagues and
  o use of other ways of co-operation, namely, research presentations in a group of doctoral students and individual consultations given by Western researchers,
- the use of corresponding research methods (I. Lūka, 2007, p. 112),
- finishing qualitative content analysis by quantitative analysis of frequencies (P. Mayring, 2004),
- data validity by
  - the method triangulation (U. Flick, 2004b, p. 179-180) and
the data triangulation (U. Flick, 2004b, p. 179).

The systemic relationship between reliability and validity (A. Kroplijs, M. Raščevska, 2004, p. 31) may be improved by (I. Lūka, 2007, p. 112)
- non-experimental research design and conducting of the research in real environment, not in a laboratory that provides highly favourable external validity,
- the data obtaining methods: observing provides highly favourable reliability and internal validity, and expert assessment highlights highly favourable external validity,
- numerical data reveals highly favourable reliability and internal validity, and descriptive statistics – external validity and
- similarly, statistical testing of hypothesis provides highly favourable reliability and internal validity and content analysis – external validity.

Analysis of the qualitative evaluation research designs (E. Kardoff, 2004, p. 138-139; P. Mayring, 2002, p. 64; I. Lūka, 2008, p. 5; I. Tiļļa, 2003; Ž. Akopova, 2004) reveals the following phases of the qualitative evaluation research design to evaluate English for Academic Purposes activity for the development of student teachers’ communicative competence as described in Table 1:

**Table 1**
The qualitative evaluation research design to evaluate English for Academic Purposes activity for the development of student teachers’ communicative competence

<table>
<thead>
<tr>
<th>Phase of the research design</th>
<th>Phase characteristics</th>
<th>Research Stages</th>
<th>Stage’s techniques</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1</td>
<td>Preparing the qualitative evaluation research</td>
<td>September 2007 to August 2008</td>
<td>- analysis of theoretical sources, - development of the research methodology, - determination of the initial hypothesis and criteria, - development of the research design, - analysis of the socio-cultural context of the research based on needs analysis of macro- (researchers), mezo- (educators) and micro- (students) level, - syllabus <em>Social Interaction Experience</em> worked out, - syllabus <em>Cognitive Experience</em> worked out, - a pilot study implemented</td>
</tr>
<tr>
<td>Phase 2</td>
<td>Carrying out the qualitative evaluation research</td>
<td>September 2008 to August 2009</td>
<td>- analysis of theoretical sources, - specifying of the research methodology, setting the hypothesis and criteria, - implementation of the syllabus <em>Social Interaction Experience</em>, - implementation of the syllabus <em>Cognitive Experience</em>, - description of the practice based on certain cases: two surveys of the students’ communicative competence in the sample group (75 students and four educators), - data gathering, analysis and interpretation carried out</td>
</tr>
<tr>
<td>Phase 3</td>
<td>Analysis of the qualitative evaluation research results</td>
<td>September 2009 to September 2010</td>
<td>- analysis of theoretical sources, - generalization of the model: two surveys of the students’ communicative competence (75 students and four educators), - summarizing the research results on the use of the organization model of English for Academic Purposes activity for the development of student teachers’ communicative competence</td>
</tr>
</tbody>
</table>
2.3 Methods of Qualitative Evaluation Research Design

Mixed methods strengthen validity of the research results in social sciences (A. Tashakkori, C. Teddlie, 2003; M. Chatterji, 2005; J. W. Creswell, 2009). Mixed methods are used to evaluate the results of a new approach or didactic model by covering a longer period – from piloting to its final evaluation. The use of evaluation of different levels provides a feedback and interaction among evaluators (I. Lūka, 2007, p. 112). Evaluation may be classified by:

- five phases in evaluation (I. Lūka, 2007, p. 104), namely,
  - preparation of evaluation plan,
  - goal determination,
  - aim of practice change,
  - justification of the criteria and
  - evaluation and presentation of practice changes,

- aims of evaluation (R. Hahele, 2006, p. 150), namely,
  - diagnostic evaluation carried out at the course beginning to get information about students’ knowledge and skills,
  - formative evaluation organized in the course process to evaluate students’ gradual educational progress and
  - summative evaluation at the course end points to consider whether students have achieved their aims and pointed to the next (higher) educational level,

- types of evaluation (R. Hahele, 2006, p. 150-151), namely,
  - self-evaluation is the students’ process to think, analyze and plan their learning in accordance with criteria worked out together with the educator that results in a report called self-evaluation in a written form,
  - internal evaluation is the process when the educator and students evaluate the student’s work in accordance with the joint criteria as well as students and the management of the educational establishment evaluate the educator’s work that results in a report called internal evaluation in a written form and
  - external evaluation is the process by external experts to evaluate the work of educators, students and the managements of the educational establishment in accordance with certain criteria that results in a report called external evaluation in a written form.

The use of mixed methods is a necessary precondition to obtain generalized information about the research context (I. Lūka, 2007, p. 112). The use of mixed methods comprises specific factors that are related with the context, which influence the results. It gives an insight into successful possibilities of realization, causal relationship and conditions (M. Chatterji, 2005). Mixed methods are used to measure the phenomena observing students’ social and individual differences, which is an essential feature of human pedagogy (I. Lūka, 2007, p. 112). Implementation of mixed methods of the research provides more precise results as quantitative methods mainly reveal the amount of differences but qualitative methods enable to understand them (A. Hunter, J. Brewer, 2003). The qualitative evaluation research is provided by a variety of procedures (E. Kardoff, 2004, p. 141), namely, different forms of interview, problem-based group discussions, participant
observation, network maps, sequence documentation, documents analysis, field research methods, personal records made by the investigator, etc as well as the use of qualitative evaluation research comprises innovative methods, namely, future workshops, workplace conversations, simulations, map-questioning, mind-mapping and Delphi-techniques (E. Kardoff, 2004, p. 141).

Qualitative data obtained using observations and interpreted implementing qualitative data processing methods may be generalized by conducting surveys and statistical analysis of the obtained quantitative data (H. Siegel, 2006, p. 11). The methods of data obtaining contribute to the use of the methods of data processing and data analysis, for example, the use of quantitative data obtaining and data processing methods are intended for descriptive statistics (E. von Kardoff, 2004, p. 141). Implementation of mixed methods enables a researcher obtaining wide scope of data at the same time studying a research question in a more detailed way thus providing more comprehensive results of the research (A. Hunter, J. Brewer, 2003). The emphasis is put on three properly fitted methods to be sufficient for a good research (K. Oganisjana and T. Koke, 2008, p. 231) as highlighted in Table 2.

The basic directions of the model of the qualitative evaluation research design, namely,
- from diagnostic evaluation to summative evaluation through formative evaluation,
- from self-evaluation to external evaluation through internal evaluation,
- from the context analysis to evaluation through observation,

determine the model essence and its sequence of implementation, namely, from preparing the qualitative evaluation research to the analysis of the qualitative evaluation research results through carrying out the qualitative evaluation research.

### Table 2

<table>
<thead>
<tr>
<th>Phase</th>
<th>Phase's characteristics</th>
<th>Focus on the aim of evaluation</th>
<th>Focus on the type of evaluation</th>
<th>Methods of data obtaining</th>
</tr>
</thead>
</table>
| Phase 1 | Preparing the qualitative evaluation research:  
- defining the research problem,  
- determining the research hypothesis,  
- creation of the theoretical model,  
- sampling,  
- exploration of the context of the macro-, mezzo- and micro- levels | Diagnostic | Self-evaluation | Context analysis:  
- document analysis,  
- student self-evaluation |
| Phase 2 | Carrying out the qualitative evaluation research:  
- description of the practice based on certain cases: two surveys of the students’ communicative competence in the sample group,  
- examining the hypothesis and  
- data processing and analysis, | Formative | Internal evaluation | Observing:  
- educators’ evaluation,  
- students’ self-evaluation |
Further, the theoretical model of the qualitative evaluation research design is used to examine efficiency of English for Academic Purposes activity for the improvement of students' communicative competence.

3. Research design

3.1. The research purpose and questions

The present research was conducted during the implementation of English for Academic Purposes activity in the English for Academic Purposes course within the master programmes School Management, Pedagogy and Music Pedagogy of Riga Teacher Training and Educational Management Academy in 2008-2009 to examine efficiency of English for Academic Purposes activity for the development of students’ communicative competence in order to promote the quality of studies. Its topicality is determined by ever-increasing flow of information in which an important role is laid to communicative competence to get information and gain experience. The research question is as follows: has English for Academic Purposes activity been efficient to promote the development of the students’ communicative competence?

3.2. Description of the implementation of the English for Academic Purposes course in the Masters’ programmes

The two-year master studies are aimed at facilitating students’ research success, supporting preparation for international Ph.D. programmes in the European Union, further specializing in the chosen field and learning in a simulated environment. A graduate has the opportunity to continue to study in the doctoral study programme. The aim of the English for Academic Purposes course in the two-year masters’ programmes is to improve student teachers’ communicative competence in English for Academic Purposes for the participation in international research activities. English for Academic Purposes activity involves various forms and/or teaching/learning techniques and/or activities, namely, discussion, prepared talk, communication games and information-gap activities (Zaščerinska, 2009) to promote student teachers’ communicative competence in English for Academic Purposes.

3.3. The sample of the research

The sample comprised four language educators and 75 master students of Riga Teacher Training and Educational Management Academy in the 2008/2009 study year, namely,
- 30 students of the first year within the professional master’s study programme School Management,
- 25 students of the first year within the professional master’s study programme Pedagogy and
- 25 students of the first year within the professional master’s study programme Music Pedagogy.

The sample with different upbringing backgrounds and with diverse educational approaches (A. Gulbe, 2008, p. 79) was selected. 60 of the students had certain expectations from the master programmes and, consequently, from the English for Academic Purposes course, which were demonstrated in the answer to the question why they had chosen this programme. The students’ communicative competence in English for Academic Purposes in the studies was one of the answers.

3.4. Research methodology

This study is oriented towards the revealing of efficiency of English for Academic Purposes activity for the development of student teachers’ communicative competence in order to promote the quality of studies within the English for Academic Purposes course in teacher education. Efficiency involves quality and effectiveness whereas quality is an idea of what are the “right things” that we are doing, and procedures for checking that we are “doing things right” (A. C. Grima, M. Candelier, A. Fitzpatrick, R. Halink, F. Heyworth (editor), L. Muresan, D. Newby, 2003, p. 82) and effectiveness is the aim achievement at a certain quality spending minimal time and energy (I. Žogla, 2001, p. 197).

Efficiency of English for Academic Purposes activity involves the relationship between inputs, namely, opportunities of gaining experience in the frame of the present research, and outputs (D. Robbins, 2007, p. 50), namely, communicative competence as a result – a level of quality of student’s activity (I. Maslo, 2006, p. 54) in a process (R. Hahele, 2006, p. 148). English for Academic Purposes activity is efficient if the inputs produce the maximum output (European Commission, 2006, p. 2) where the change of the focus from an input based teaching/learning process to an outcome based process is emphasized (D. Bluma, 2008, p. 673).

Students’ communicative competence is the outcome criterion of English for Academic Purposes activity. Evaluation of students’ communicative competence is evaluation with the focus not on evaluation of study results but with the focus on evaluation of inter-connections between activity and its results in the united system of criteria (R. Hahele, 2006, p. 148, 152) that comprises self-evaluation, internal evaluation and external evaluation (I. Maslo, 2006, p. 53).

An explorative research has been used in the research (A. Tashakkori, C. Teddlie, 2003). The study consisted of the following stages: exploration of the contexts in student teachers’ communicative competence in English for Academic Purposes in Latvia through thorough analysis of the documents, analysis of the students’ feedback regarding their needs, data processing, analysis and data interpretation and analysis of the results and elaboration of conclusions and hypothesis for further studies.

4. Findings of the Research

4.1 Analysis of the Students’ Self-Evaluation of the Research Results

For the analysis of the qualitative evaluation research results the phase of the analysis of the qualitative evaluation research involves the analysis of the students’ self-evaluation of the research results.

In order to find out how each student’s communicative competence changed after the implementation of English for Academic Purposes activity the analysis of the students’ self-evaluation of the communicative competence within the English for Academic Purposes course comprised the structured interviews in the group of 10 first-year master students within the professional master’s study programme School Management. The structured interviews conducted to analyze the students’ self-evaluation of the communicative competence within
English for Academic Purposes activity included three questions, namely, what is your attitude to the English for Academic Purposes activity? What have you learned? How can you apply this knowledge in your professional field? The aim of the interviews was to reveal the students’ point of view on English for Academic Purposes activity for the development of the students’ communicative competence. For example, Student F2 thanks for giving a chance to participate in English for Academic Purposes activity: “I learned a lot from the language course. It is very useful in our daily life. From this course I learned how to make a presentation better, and etc.” Student F2 confirms that the learning outcomes, namely, the student’s communicative competence, were enriched: “I can communicate with others more confidently.” Comparing the answers of those 10 students in the sample, the structured interviews reveal the students’ positive attitude in forming their communicative competence. That shows that environment influences the studies and the learning outcomes.

2.4.2. Analysis of the internal evaluation of the research results
For the analysis of the qualitative evaluation research results the phase of analysis of the qualitative evaluation research includes analysis of the internal evaluation of the research results. Internal evaluation involves internal evaluators, namely, students and educators of the educational establishment (R. Hahele, 2006, p. 151). In order to find out how each student’s communicative competence changed after the implementation of English for Academic Purposes activity the analysis of the internal evaluation of the students’ communicative competence within the English for Academic Purposes course comprised the data processing, analysis, interpretation of the results of Survey 1 and 2 of 75 first-year master students within the professional masters’ study programmes School Management, Pedagogy and Music Pedagogy. The Mode results of the descriptive statistics demonstrate that the level of the students’ communicative competence in terms of the students’ learning achievements in General English has changed in Survey 2 (6) in comparison with Survey 1 (2), in Professional Language has improved in Survey 2 (6) in comparison with Survey 1 (2) and in English for Academic Purposes has developed in Survey 2 (6) in comparison with Survey 1 (2).

The positive changes in the individual results of two surveys of the students’ communicative competence in the English for Academic Purposes course within the professional masters study programmes School Management, Pedagogy and Music Pedagogy have been revealed, namely, all the 75 students have improved the level of the communicative competence in terms of the students’ learning achievements in General English, Professional Language and English for Academic Purposes.

The p-value results of Pearson’s correlation analysis [Pearson] reveal that the difference between General English_2 – General English_1 is very significant, the difference between Professional Language_2 – Professional Language_1 is significant and the difference between English for Academic Purposes_2 – English for Academic Purposes_1 is very significant.

Hence, considering judgment to be part of the art of statistics (G. Gigenzer, 2004, p. 603), the results of the research Implementing English for Academic Purposes activity reveal that two of the phases of the implementation of English for Academic Purposes activity significantly influenced the development of the student teachers’ communicative competence by the criteria, namely, the students’ learning achievements in General English and English for Academic Purposes, out of three possible criteria determined by the significance in difference between the levels at the beginning and at the end of the present empirical study [p=0.000].

2.4.3. Analysis of the external evaluation of the research results
For the analysis of the qualitative evaluation research results the phase of the analysis of the qualitative evaluation research comprises the analysis of the external evaluation of the research results in June 2009.
For the external evaluation the phase of the analysis of the qualitative evaluation research involves seven researchers from different countries. It should be marked that all the researchers participated in the external evaluation of the research results are professors in the fields connected with educational research.

The analysis of the external evaluation of the research results comprised the non-structured interview. The non-structured interviews to analyze English for Academic Purposes activity for the development of the students’ communicative competence included one question, namely, what the researchers’ point of view on the present research on English for Academic Purposes activity for the development of students’ communicative competence is. The aim of the non-structures interviews was to reveal the researchers’ point of view on English for Academic Purposes activity for the development of students’ communicative competence.

Researcher *EER1* emphasized the use of English for Academic Purposes activity in studies of other foreign languages. The researcher underlined that English for Academic Purposes activity is clearly- and well-organized. Researcher *EER1* considered that English for Academic Purposes activity provides the development of students’ communicative competence.

Researcher *EER2* revealed that the present research on English for Academic Purposes activity for the development of students’ communicative competence includes a great deal of valuable discussion.

Researcher *EER3* considered the organization model of English for Academic Purposes activity for the development of students’ communicative competence to be a transformative methodology. The researcher stressed the following advantages of English for Academic Purposes activity:

- focus of establishing a system,
- the fascinating idea of positioning the *quasi-concept* within the *quasi-autonomous zone*,
- viewing the overall personality of the learner,
- the fact that educators can indeed change the typical classroom environment, and that the theory could be highly successful in practice,
- good point to connect the external with the internal,
- Vygotsky’s Law of Development selected,
- the scheme titled *Organisation of Productive Professional Environment*, including both external and internal factors,
- the unique approach: a potential model for the tertiary teaching/learning indicates how the steps of the process are related following a logical chain: existing concept $\rightarrow$ quasi-concept $\rightarrow$ concept where the basic directions of the development of the organization model of tertiary teaching/learning designed by the author of the present research are as follows: from existing concept to concept through quasi-concept and from object-regulation to self-regulation through other-regulation that determine the essence and sequence of the implementation of the organization model for tertiary teaching/learning,
- developing newer constructs that will truly help the student to internalize new material and
- the student having the “ability to create knowledge”.

Researcher *EER4* emphasized the conditions, criteria, indicators and levels of the development of students’ communicative competence to be important for the innovative process in education. Researcher *EER5* found the approach used for the development of students’ communicative competence “promising and worthwhile”.

Researcher *EER6* revealed the present research on English for Academic Purposes activity for the development of students’ communicative competence to be “argumentative in which both the methodological and theoretical underpinning are described”.

Researcher *EER7* put the emphasis on the use of English for Academic Purposes activity in master and PhD studies. Moreover, the researcher proposed an English for Academic Purposes educator to be a non-native speaker in order to focus the students on the contents of English for Academic Purposes activity.
The use of the hermeneutic approach to the data analysis reveals that the respondents evaluate English for Academic Purposes activity for the development of students’ communicative competence positively. The researchers’ external evaluation validates the findings of the present research on English for Academic Purposes activity for the development of the students’ communicative competence. Thus, the conclusion can be drawn that the implementation of English for Academic Purposes activity enhances students’ communicative competence.

5. Conclusions and Hypothesis for Further Studies
The findings of the present research allow drawing conclusions on efficiency of English for Academic Purposes activity applied to enhance the communicative competence of 75 first-year master students within the professional masters’ study programmes School Management, Pedagogy and Music Pedagogy in the 2008/2009 study year. Regarding quality assurance it is evident that the students’ communicative competence has been enriched. Irrespective of levels in the students’ initial language capacity and different combination of languages, English for Academic Purposes activity has become an effective means of acquiring social experience by the students and has served as a motivating factor to continue language learning in order to improve their communicative competence. The provided support for students, namely, English for Academic Purposes activity, resulted in the improved students’ communicative competence.

Summarizing the results of the second survey of the communicative competence of 75 first-year master students within the professional masters’ study programmes School Management, Pedagogy and Music Pedagogy in the 2008/2009 study year at Riga Teacher Training and Educational Management Academy after the implementation of English for Academic Purposes activity reveals that all the 75 students have improved the level of the communicative competence in terms of the students’ learning achievements in General English, Professional Language and English for Academic Purposes. Therein, the implementation of English for Academic Purposes activity has contributed to the development of the students’ communicative competence.

Regarding effectiveness of the educator’s contribution to the students’ communicative competence it is evident that the students enriched their achievements with the implementation of the support system, namely, English for Academic Purposes activity. The use of English for Academic Purposes activity is positively evaluated by the students, educators and researchers. That shows that experience and environment influence the studies and the communicative competence. Hence, English for Academic Purposes activity for the development of students’ communicative competence influences and determines the students’ success or failure for acquiring tertiary language education and profession as illustrated in Figure 1.
Thus it might be stressed that English for Academic Purposes activity is efficient if it provides student’s learning achievements as a condition for creation of new knowledge:

- if students’ development of the communicative competence is supported by English for Academic Purposes activity, students better attain learning outcomes, and
- if students’ needs are met and a support system is created that would secure their learning achievements, students demonstrate better results of the communicative competence.

The present research has limitations. A limitation is the empirical study conducted by involving the students and educators at master level of one tertiary institution. Therein, the results of the study cannot be representative for the whole country. As well as the empirical study marks the opportunities of the development of the students’ communicative competence. Nevertheless, the results of the research, namely, the definition of the students’ communicative competence, the criteria and indicators and the levels of the development of the students’ communicative competence and the organization model of English for Academic Purposes activity, may be used as a basis of the development of the students’ communicative competence at master level of other tertiary institutions. If the results of other tertiary institutions had been available for analysis, different results could have been attained. There is a possibility to continue the study. The following hypothesis for further studies is put forth: students’ communicative competence develops within English for Academic Purposes activity if students use existing opportunities with other participants in English for Academic Purposes activity and the educator organizes various opportunities to interact thereby promoting the improvement of the students’ communicative experience.

References


ESSENTIAL ASPECTS OF QUALITY ASSURANCE IN TECHNICAL TEACHER EDUCATION AT TALLINN UNIVERSITY OF TECHNOLOGY

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Abstract. A curriculum for technical teacher education has been designed and implemented at Tallinn University of Technology, being accredited by International Society for Engineering Education IGIP, meeting all accreditation criteria and requirements for curricula of technical teachers: organisation of the programme, entrance requirements, skills/abilities and study outcomes, engineering pedagogical curriculum, qualification of the professors, institutional resources, quality control and feedback of a multi-layered educational process for quality assurance and quality improvement. The minimum standard for acceptance of students is completed degree in engineering on Master level. The amount of studies being 60 ECTS credits. The curriculum has been designed taken account of required international study outcomes for technical teachers and evaluation based on them. A complete analysis has been carried out to specify the correspondence of study outcomes of the curriculum to the international requirements of IGIP and to Estonian national legal acts regulating teacher education. Detailed examination regulations showing how the achievement of the study outcomes of individual modules and overall course programme are monitored and conformed. The education is completed by the final Master degree examination, consisting of a written examination, presentation and discussion of the portfolio with examination interview and an interactive lecture in the relevant engineering subject. It is expected that the graduate of a programme, in addition to a high degree of engineering expertise, can also demonstrate solid competences in engineering pedagogy, thus ensuring the quality of teaching engineering subjects at vocational schools, gymnasiums, colleges or universities. The employers of the graduates are regularly polled about the relevance and quality of the engineering pedagogical training.

Key words: quality in technical teacher education, quality of a multi-layered education process, engineering educational competences, criteria for accreditation.

Introduction

Education is a dynamic phenomenon, recognising the changes in the environment and responding to growing demands and challenges. Engineering education is a large system and it is almost impossible to predict its behaviour over far too distant future since the system parameters show a high rate of change. Changes in society present challenges to education. In order to educate not reactors to changes but, first and foremost, directors and executors of changes, it is important to promote the development of corresponding attitudes and skills in the students. These skills and attitudes are developed with the support of school, the key person being a teacher.
Quality of engineering education crucially depends on the quality of teaching engineering. In order to improve the quality of engineering education, the foremost mission should be the improvement of the quality of education of technical teachers. Without improving the education of educators we cannot bring about any positive changes in the overall educational system.

For the purposes of the present study the following terminology proposed by UNESCO (UNESCO 1973) has been used: Technical teacher: a person teaching general and special technical theory in educational institutions on the upper secondary or post-secondary level the aim of which is to educate and train technicians/engineers. Usually the technical teacher is responsible for both classroom and laboratory work, but may also supervise practical workshop training to the extent required in order to integrate the theoretical and practical aspects of technical education, he/she may be assisted in laboratory work by appropriately qualified laboratory technicians. Technical teacher has academic higher engineering education.

Technical teachers need both a fundamental engineering education and professional experience and a comprehensive teaching training. A successful curriculum meets the needs of the contemporary further education sector, while guaranteeing academic standards appropriate to the teaching profession. A curriculum of modern engineering educators should make scientifically-founded and practice-oriented teacher training possible, so that teachers can expect to build a deeper understanding of the principles, problems and solutions associated with teaching learners in technical institutions. They should also gain greater confidence in their own skills and abilities through the use of an extended range of tools, techniques and activities.

**Proposed Methodology of the Curriculum Design**

In order to understand the curriculum process, it is necessary to offer a definition of the curriculum. According to John Heywood (Heywood 2005) curriculum is the formal mechanism through which intended educational aims are achieved. Since educational aims are achieved by learning, the curriculum process is described by those factors that bring about learning. Thus both, learning and instruction are central to the curriculum process.

The designed curriculum is based on the Frame Curriculum of International Society for Engineering Education (IGIP), the basic concept of which calls for a life-long continuous improvement process to excellent teaching and learning. The curriculum of IGIP represents a triad of knowledge, teaching methodology and of value ethical attitudes in a double bond manner between the corners of the didactical triangle Engineering Profession, Engineering Science and Engineering Pedagogy Science. IGIP proposed a network of modules representing learning and teaching in educational process as well as planning and developing in teaching engineering. The curriculum enables teachers to realise a future-oriented training programme for engineering and prepares them to take responsibility for a sustainable, humane and socially and environmentally compatible contribution to shaping society, the world of work and technology. Technical teachers use the knowledge and abilities acquired here in their teaching and enable the learners in turn to use complex scientific and technological systems in a competent and sustainably responsible manner which reflects the educational goal.
The ‘Circle of Engineering Pedagogy’ presented by Norbert Kraker (Kraker 2006) assumes five disciplines which help to develop technical teachers’ competencies. The five components of the circle are applied sciences (mechanical engineering, electrical engineering, software engineering, etc), social sciences (pedagogical psychology, pedagogical sociology, education and vocational education), subject-related didactics (didactics of teaching theoretical subjects, didactics of teaching in the laboratory, didactics of blended learning), supervised teaching practice (in the different learning environments) as well as additional courses (communication skills, a foreign language as a medium of instruction, administration, quality management, project work). The ‘Circle of Engineering Pedagogy’ has served as the basis of the proposed curriculum.

If a curriculum can, or must, be viewed in terms of these four above described elements, different planning models will emerge according to the ways in which we might per-mutate those elements, the priorities we might give to them and the choice of focus we might adopt. Within this model educational purposes take pride of place, content is selected not for its own sake but for its presumed efficacy at enabling us to achieve those purposes, organization is similarly designed with these objectives in mind, and evaluation is framed so as to assess how far those objectives have been achieved.

Technical teachers should pass preliminarily higher engineering education at least on Master level and obtain solid knowledge in a certain field of engineering. Successive courses for technical teachers should not exceed a year. Length of the courses has been a key factor in the professional judgement of the standard of courses. In compliance with F. Hrdlička and J. Měřička (Hrdlička & Měřička 2006) one of the main problems of training technical teachers is the relation of engineering education and educational studies. High engineering competency is generally required which can be complemented by further educational studies. It is generally assumed that for teaching engineering particularly on post-secondary level more professional or specialised education and less educational training is required (Hrdlička & Měřička 2006).

During the past 3 years the curriculum development for technical teachers has been of essential importance in Estonian Centre for Engineering Pedagogy at Tallinn University of Technology. A three-staged methodology for curriculum design has been used. The proposed methodology for the course design started with decisions on overall goals, learning objectives and intended learning outcomes and the basic principles and methods of assessment.

The following three-staged methodology has been used for the design of the curriculum (Heywood 2005):  
1. **Problem Definition** – Identification of education-occupation linkages or needs which arise from three areas (establishing the goals and objectives or qualification profile in terms of desired knowledge, skills and attitudes) namely:
   - Society needs;
   - Professional needs;
   - Industrial needs.

2. **Structuring the Curriculum** – The objective of structuring is to achieve the qualification profile. Changes in ways of thinking, in fundamental habits, in skills, attitudes and interests, develop over time and require cumulative effect of many learning experiences. To produce the cumulative effect, educational experiences should be organised to reinforce each other. Curriculum development is conducted at two levels:
- **Macro-level**, the final result of structuring is that the curriculum will be defined by syllabus, a timetable, an idea of teaching methods – lectures, seminars, laboratory work, independent individual work, etc to be used;
- **Micro-level**, where the subject providers plan their activity.

3. **Implementation and Evaluation** – Implementation is the process of carrying out the designed curriculum into practice in the university and evaluating, modifying or improving as necessary. Evaluation is essentially the process of determining to what extent the educational goals and objectives are being met by the curriculum.

In order to assure the high quality of the curriculum, following five means for reinforcing the curriculum established at the macro-level have been used:
1. Computers in instruction;
2. Laboratory work;
3. Individualised instruction;
4. Self-access media;
5. Project and research work.

The used methodology for the course design started with decisions on overall goals, learning objectives and intended learning outcomes and principles of assessment. The curriculum was designed according to the following model:
1. **Establishing Qualification Profile** – expectations of employers, qualities (knowledge, skills and attitudes) the graduates should possess were considered and expressed as learning outcomes.
2. **Establishing Admission Quality** – appropriate entry qualities were settled.
3. **Defining Course Content** – the course content should develop communication skills, analytical capability, skills for project, research and laboratory work, the use of information technology and learning skills.
4. **Establishing the Curriculum at Macro Level** – establish syllabus, teaching approaches like lectures, seminars, practical lessons, etc., and timetable.
5. **Establishing the Curriculum at Micro Level** – establish module content, methods of assessments, etc.
6. **Integrating the Curriculum within the University System** – the university should have a course approval procedure and general awarding system for Master programmes.

The curriculum design process is a complex activity: each stage involves an iterative procedure, the output of which is evaluated before being used as a part of the input to the next stage. Specific learning strategies will be required if the objectives are to be successfully obtained, and this requires an understanding of the complexity of learning. A multiple strategy approach to teaching, learning and assessment should be required.

**Results of the Curriculum Design**

The curriculum for technical teachers was completed in 2006. The curriculum has been accepted and registered by Estonian Ministry of Education and Research in 2006. The study is state commissioned and free of charge for students.

Engineering Pedagogy Studies in Estonia are provided only by Estonian Centre for Engineering Pedagogy at Tallinn University of Technology. The designed curriculum is the only and the very first one in Estonia providing education in Engineering Pedagogy Science
for technical teachers on Master level in the amount of 60 ECTS credits. The curriculum is based on IGIP (International Society for Engineering Education) Recommendations for Studies in Engineering Pedagogy Science (IGIP 2006).

Students with Master degree in engineering speciality and professional experience for at least one year have been admitted to the course from 2006. It is assumed that the candidate has acquired knowledge in engineering speciality on high level.

Curriculum for engineering educators has been prepared taking account of the most popular and perspective branches of industry in Estonia. Eight possible specializations have been proposed:

1. Civil Engineering;
2. Power Engineering;
3. Geological Technology;
4. Information and Communication Technology;
5. Chemical Engineering and Material Technology (including Wood Processing, Food Engineering, Textile and Garment Engineering);
6. Logistics;
7. Mechanical Engineering;
8. Technical Physics.

Studies in Engineering Pedagogy have been planned and designed taking account of the main aspects of Klagenfurt School of Engineering Pedagogy founded by Adolf Melezinek (1999). 23 professors of Tallinn University of Technology, involved in the study process, all possessing PhD degree have passed the relevant international courses for engineering educators at Estonian Centre for Engineering Pedagogy and in Austria, at University of Klagenfurt, being awarded the title of International Engineering Educator ING-PAED IGIP. Professor teaching Engineering Pedagogy Science has doctoral degree in Engineering Pedagogy.

The structure of the designed curriculum is presented in Table 1. Accordingly to Estonian legislation, the amount of Teacher Training Practice in the curriculum is 15 ECTS credits during which lessons should be given. The practice is built on the teachers’ professional speciality qualification and provides necessary theoretical and practical pedagogical, didactical and psychological competencies to enable the teacher to be able to work at school.

The students should document on a continuous basis the learning processes and work results subject by subject in a portfolio. The portfolio contains confirmations that the candidate has completed the studies in all the modules, the complete written planning and performance of a teaching session, including video recording, and a subsequent analysis as well as the problem solving of at least one didactic case study. The portfolio should also contain self-evaluation of the study process and a learning style of an individual student. Furthermore, the complete planning, performance and analysis of a course including video recording as well as the solution of a didactic case study should be presented for the final examination to Engineering Pedagogy Colloquium – both documented in the portfolio.

Education is completed by passing the final examination. During the examination the candidates must show that they have acquired the skills of an engineering pedagogue. The final examination consists of the presentation and discussion of the candidate’s portfolio and an examination interview.
Table 1 – Structure of the Designed Curriculum

<table>
<thead>
<tr>
<th>Module</th>
<th>ECTS credits</th>
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<tbody>
<tr>
<td><strong>MODULE OF ENGINEERING PEDAGOGY</strong></td>
<td></td>
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<tr>
<td>Engineering Pedagogy Core and Basic Modules</td>
<td></td>
</tr>
<tr>
<td>Engineering Pedagogy in Theory and Practice</td>
<td>15</td>
</tr>
<tr>
<td>Laboratory Didactics</td>
<td>3</td>
</tr>
<tr>
<td>Engineering Pedagogy Theoretical Modules</td>
<td></td>
</tr>
<tr>
<td>Educational Psychology and Sociological Aspects</td>
<td>3</td>
</tr>
<tr>
<td>Didactics and Methodology of Teaching Engineering</td>
<td>2</td>
</tr>
<tr>
<td>Ethical Aspects and Intercultural Competencies</td>
<td>2</td>
</tr>
<tr>
<td>Engineering Pedagogy Practical Modules</td>
<td></td>
</tr>
<tr>
<td>Rhetoric and Communication</td>
<td>3</td>
</tr>
<tr>
<td>Media (Teaching Technology) and E-Learning</td>
<td>3</td>
</tr>
<tr>
<td><strong>SPECIALITY MODULE</strong></td>
<td></td>
</tr>
<tr>
<td>Informatics</td>
<td>4</td>
</tr>
<tr>
<td>Product Development and Innovation</td>
<td>4</td>
</tr>
<tr>
<td>Teacher Training Practice</td>
<td>15</td>
</tr>
<tr>
<td><strong>ELECTIVE SUBJECTS</strong> minimum 6 ECTS credits</td>
<td></td>
</tr>
<tr>
<td>Scientific Writing</td>
<td>3 ECTS credits</td>
</tr>
<tr>
<td>Working with Projects: Curricula</td>
<td>3 ECTS credits</td>
</tr>
<tr>
<td>Standards, Qualification and Certification</td>
<td>3 ECTS credits</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>60</td>
</tr>
</tbody>
</table>

Graduates who have fulfilled the curriculum and passed the final examination are awarded MA degree in education, and may continue their studies on doctoral level or enter labour market. Graduates may apply for a qualification of an international engineering educator from International Society for Engineering Education IGIP.

**Quality Assurance of the Study Process**

Quality of the study process depends on:

- Study environment – infrastructure, library, dormitories;
- Study programs and their development based on systematic self-evaluation and feedback from students and employers;
- Academic staff evaluated through annual performance reports (study load, supervision, publications, and research and development activities), feedback from students, requirements for election, etc.

The qualification profile of a technical teacher is based on two pillars:

1. Engineering qualification which was earned through a recognised and/or accredited engineering education followed by relevant professional experience;
2. Qualifications in engineering pedagogy acquired in the course of a comprehensive educational programme for technical teachers. The programme is generally an independent course of studies after an engineering programme. Educational
programme for technical teachers can be accredited by IGIP. To be accredited, they must meet the accreditation criteria defined by IGIP.

The purposes of IGIP accreditation are:
1. To assure that graduates of the accredited engineering pedagogical programmes are well prepared to perform their teaching duties in engineering subjects and meet the criteria for IGIP registration as an International Engineering Educator, ING-PAED IGIP.
2. To promote the quality assurance, quality improvement and modernisation of the engineering pedagogy programmes.
3. To create public awareness of the high quality of the programmes for technical teachers.

IGIP accreditation criteria defined by IGIP for the corresponding education process of a programme for technical teachers are:
1. Organisation of a programme - depending on the structural requirements of the national education system, the engineering pedagogy programme can be organised as an independent course of studies which follows a completed engineering programme on a Second Cycle degree (Master level), or integration of the engineering pedagogy programme into an engineering degree programme.
2. Entrance requirements for the first year students – the minimum standards defined by IGIP for applicants to qualify as students is completed degree in engineering from a nationally recognised course on Master level and relevant professional experience.
3. Engineering pedagogical curriculum – being the central building block of a technical teachers’ training. The institution must present documentation comprising a table, listing the curriculum modules stating the ECTS credits, detailed conditions of study stating the contents and learning goals of individual modules and assessment methods.
4. Lecturers and professors – high degrees of expertise documented by completion of relevant university degree, lecturers of engineering education module should be registered as ING-PAED IGIP, a doctorate in engineering pedagogy is recommended.
5. Institutional resources – the institution must show that suitable resources are available for the engineering pedagogical programme. Minimum standard requires the proof of suitable classrooms and practice rooms, proof of adequate, state-of-the-art media equipment (PCs, projectors, internet access, video recorders, players, etc), assistant personnel adequate to meet the capacity of the institution, adequate supply of learning materials.
6. Quality control and feedback – effective measures for quality control and assurance of the programme must be defined and implemented, a procedure must be implemented which involves surveying students about achievement of educational goals in all modules and throughout the whole programme. The address files of the graduates must be filed according the year of graduation: The graduates are surveyed about the usefulness of their training as engineering pedagogues. The employers of the graduates are regularly polled about the relevance of the training. A procedure exists and is implemented that permits changes to improve and enhance the educational process.
7. Skills and abilities of the graduates – technical teachers should acquire the following necessary engineering pedagogical competences while having passed the studies:
   • *Pedagogical, Social, Psychological and Ethical Competencies:*
     1. create a positive working and learning atmosphere
     2. prefer socially integrative leadership style in their teaching process
3. see the students as learning partners in a relationship characterised by mutual respect
4. use group-dynamics, stimulate interaction between professor and students and as well as within student groups
5. use input from students and give students room for creativity
6. use the most important consequences of steps of human information processing (Frank Organisational Chart) to design their courses
7. support students in the development of their professional identity
8. use motivating measures in their teaching
9. stimulate "value-orientation" in the students and are aware of their own ethical point of view (within the field of conflict between humans, society and the environment)
10. behave as a representative of his or her professional group

- Didactical Skills and Subject Expertise:
  1. use engineering pedagogy models of the teaching process for creating their own lessons
  2. use in their own teaching variations of the information flow
  3. observe the components of the six-dimensional education space in their own teaching and relate these to the selected teaching method
  4. provide insight into the selected didactic method and rethink this with colleagues and students
  5. set clear teaching goals, select suitable materials and structure them appropriately
  6. chose by conscious consideration of the components of the teaching process the best teaching methods and strategies, e.g. laboratory didactics and project work.
  7. find illustrative explanations and clear communication important and act accordingly
  8. integrate new development in technology and didactics into their own teaching
  9. create an inspiring learning environment for students
  10. is skilled in voice training
  11. focus on clarity to fascinating persuasive power
  12. are comfortable using what may be called the "classic" teaching media, as well as the optimal creation of a corresponding "new" teaching media (e.g. learning platforms, note book classes, etc)
  13. are able to utilize ICT for students’ study support
  14. take into account the differences between students in the learning process (e.g. intercultural differences)
  15. use the experience of students, build on these experiences, and stimulate students to translate these experiences into practical subjective working theories. Advise students on portfolio work
  16. stimulate students:
     - to include their experiences in the learning process;
     - to be responsible for their actions;
     - to assess themselves as professional engineers.

- Evaluative Competencies:
1. develop instruments for (self-)assessment of professional engineering skills
2. assess their own teaching activity and draw corresponding consequences
3. have the knowledge of theory of assessment and its psychological aspects
4. monitor and record student progress during the learning process
5. experts additionally the handling of open-ended learning processes - judging

• Organisational / Management Competencies:
  1. create an adequate physical and virtual learning environment
  2. have a good time management for their own work
  3. have mastery in the systematic planning and organisation of specialised scientifically oriented projects
  4. observe relevant laws and keep track of educational policy
  5. administer their relevant data adequately
  6. improvise if necessary

• Communicative and Social Competencies:
  1. work in trans-disciplinary teams
  2. apply the four most important dimensions of “intelligibility”
  3. make their own teaching vision explicit, relate it to the visions and concepts of their colleagues and communicate about it
  4. contribute to the development of guidelines and visions of their profession
  5. contribute to the modernisation of the process of teaching
  6. have a relevant regional or (inter)national network
  7. contribute to knowledge in the field of engineering pedagogy and communicate
  8. communicate satisfactorily both orally and in writing in a variety of contexts
  9. wield effective presentation skills
  10. be competent in scientific writing

• Reflective and Developmental Competencies:
  1. appreciate new developments (e.g. new technologies) and integrate them into their teaching
  2. systematically rethink their own teaching strategies and their teaching behaviour
  3. make their own learning process transparent to students and colleagues
  4. are willing and in the position of initiating an IGIP accreditation and an IGIP registration as an engineering pedagogue

A complete analysis has been carried out to specify the correspondence of study outcomes of the curriculum to the international requirements of IGIP and to Estonian national legal acts regulating teacher education. Detailed examination regulations showing how the achievement of the study outcomes of individual modules and overall course programme are monitored and conformed.

For establishing external cooperation and networking opportunities there have been close contacts and discussions with directors of the biggest Centres of Vocational Education in
Estonia, representatives of the Ministry of Education, universities, industries and Non Governmental Organisations. The employers of the graduates are regularly polled about the relevance and quality of the engineering pedagogical training.

The curriculum has been accredited by IGIP in 2007 and accreditation is valid till 2013.

**Discussion**

Understanding students’ different learning styles is one of the midpoints of teacher training quality. The aim of the study programme for technical teachers is to abolish mismatches between students’ common learning styles and traditional teaching styles of technical teachers and make teaching in engineering more effective, to equip future technical teachers with the skills associated with every learning style category, regardless of the students’ personal preferences, since they will need all of those skills to function effectively as professionals.

Technical teachers should attempt to improve the quality and efficiency of their teaching, which in turn requires understanding the learning styles of engineering students and designing instruction to meet them. The problem is that two students are never alike. They have different backgrounds, strengths and weaknesses, interests, ambitions, senses of responsibility, levels of motivation, and approaches to studying.

According to Richard M. Felder (1993) students learn in many ways – by seeing and hearing; reflecting and acting; reasoning logically and intuitively; memorising and visualising; drawing analogies and building mathematical models. Teaching methods also vary. Some teachers lecture, others demonstrate and discuss; some focus on principles and others on applications; some emphasise memory and other understanding. How much a student learns in a class is governed by student’s ability and prior preparation, but also by compatibility of student’s learning style and the instructor’s teaching style.

Mismatches exist today between common learning styles of engineering students and traditional teaching styles of engineering professors. Most engineering students are visual, sensing, inductive, and active, and some of the most creative students are global, but most of engineering education is auditory, abstract (intuitive), deductive, passive, and sequential. In consequence students become bored and inattentive, do poorly tests, get discouraged, and in some cases change to other curricula or drop out of school (Felder 1993).

At Estonian Centre for Engineering Pedagogy the study programme for technical teachers is based on Felder-Silverman learning and teaching style model for engineering education (Felder 1988). The future technical teachers get acquainted with following different learning styles of engineering students: sensing/intuitive learners (sensing learners like facts, data, and experimentation; intuitive students prefer principles and theories); visual/auditory learners (visual learners prefer sights, pictures, diagrams, symbols; auditory learners – sounds and words); inductive/deductive learners – induction is a reasoning progression from particulars (observations, measurements, data) to generalities (governing rules, laws, theories); deduction proceeds in the opposite direction; active/reflective learners (active experimentation involves doing something with the information: discussing it or explaining or testing; reflective observation involves examining and manipulating the information introspectively); sequential/global learners (sequential learners learn in a logically ordered progression, global learners learn in fits and starts: they may be lost for days or weeks, until suddenly they “get it”).
Analysis of the students’ learning styles at Estonian Centre for Engineering Pedagogy has been carried out according to above introduced methodology created by Richard Felder (1993). As the result of the analysis, the future technical teachers, students studying at Estonian Centre for Engineering Pedagogy, were classified as follows: of the analysed 68 students, 61% were classified as active learners, 39% were classified as reflective learners, 64% were sensing learners, 30% were intuitive learners, 87% were visual learners, 15% were verbal learners, 55% were sequential learners and 34% were global learners.

As the results of the analysis present, 64% of students were sensors, while traditional engineering instruction is usually oriented toward intuitive learning, emphasizing theory and mathematical modelling. 87% of the students were visual learners, but most of engineering instruction is overwhelmingly verbal, emphasizing written explanations and mathematical formulations of physical phenomena. 61% of the students were active, while most engineering courses other than laboratories rely on lectures as the principal method for transmitting information. 55% of the students classified themselves as sequential learners and as traditional engineering education is heavily sequential, relevantly there is no mismatch between students’ learning style and instructors’ teaching style in this case. 34% of students were global learners. According to Richard Felder (2005) global learners are multidisciplinary thinkers with broad vision. Unfortunately, traditional engineering education is sequential and does little to provide students with global learning style to meet their needs.

As it could be seen from the results of the analysis, in engineering education there is a great mismatch between students’ learning styles and instructors’ teaching methods. Thus it is of high importance for technical teachers to make instruction more effective to abolish these mismatches, and taking account of them.

Although the diverse styles with which students learn are numerous, the inclusion of a relatively small number of techniques as an instructor’s teaching tools should be sufficient to meet the needs of most or all of the students in any engineering class. The techniques and suggestions presented below should serve this purpose in any case.

The following recommended teaching techniques suitable for engineering education to address all learning styles serve as the basis of instruction at Estonian Centre for Engineering Pedagogy at Tallinn University of Technology to future technical teachers:

1) Motivate learning. As much as possible, relate the material being presented to what has come before and what will to come in the same course, to material in other courses, and particularly to the students’ personal experience (inductive/global).

2) Provide a balance of concrete information (facts, data, real or hypothetical experiments and their results) (sensing) and abstract concepts (principles, theories, mathematical models) (intuitive).

3) Balance material that emphasizes practical problem-solving methods (sensing/active) with material that emphasizes fundamental understanding (intuitive/reflective).

4) Provide explicit illustrations of intuitive patterns (logical inference, pattern recognition, generalization) and sensing patterns (observation of surroundings, empirical experimentation, attention to detail), and encourage all students to exercise both patterns (sensing/intuitive).

5) Follow the scientific method in presenting theoretical material. Provide concrete examples of the phenomena the theory describes or predicts (sensing/inductive); then develop the theory or formulate the mod (intuitive/inductive/sequential); show how
the theory or mod can be validated and deduce its consequences (deductive/sequential); and present applications (sensing/deductive/sequential).

6) Use pictures, schematics, graphs, and simple sketches liberally before, during, and after the presentation of verbal material (sensing/visual). Show films (sensing/visual). Provide demonstrations (sensing/visual), hands-on, if possible (active).

7) Use computer-assisted instruction – sensors respond very well to it (sensing/active).

8) Do not fill every minute of class time lecturing and writing on the board. Provide intervals – however brief – for students to think about what they have been told (reflective).

9) Provide opportunities for students to do something active besides transcribing notes. Small-group activities that take no more than five minutes are extremely effective for this purpose (active).

10) Assign some drill exercises to provide practice in the basic methods being taught (sensing/active/sequential) but do not overdo them (intuitive/reflective/global). Also provide some open-ended problems, questions and exercises that call for analysis and synthesis (intuitive/reflective/global).

11) Give students the option of cooperating on homework assignments to the greatest possible extent (active). Active learners generally learn best when they interact with others; if they are denied the opportunity to do so they are being deprived of their most effective learning tool.

12) Applaud creative solutions, even incorrect ones (intuitive/global).

13) Talk to students about learning styles, both in advising and in classes. Students are reassured to find their academic difficulties may not all be due to personal inadequacies. Explaining to struggling sensors or active or global learners how they learn most efficiently may be an important step in helping them reshape their learning experiences so that they can be successful (all types).

The idea is not to use all the above described techniques in every class but to choose several that look feasible and try them, keeping the ones that work, dropping unsuitable, and trying some more in the next course. In this way a teaching style that is both effective for all students and comfortable for technical teachers will effect positively on the quality of engineering students’ learning.

Future technical teachers at Estonian Centre for Engineering Pedagogy must take account of presented teaching techniques suitable for all learning styles. During their studies in the subject of Engineering Pedagogy Science in Theory and Practice they prepare their teaching material in chosen engineering speciality accordingly and present it relevantly. The video record of their presentation is later analysed and discussed in the seminars.

Conclusion

A technical teacher needs to possess skills in at least two distinct areas: an engineering discipline and the art of teaching. A good teacher balances these two areas. As the practice of Estonian Centre for Engineering Pedagogy shows there is a wide interest towards the new courses and interest will remain high as there are no other appropriate courses in Estonia today.

The point of taking account of different learning styles in teaching engineering is not to determine each student’s preferred instructional approach and teach exclusively in that manner. It is rather to “teach around the cycle,” making sure that every style is addressed to
some extent in the instruction. If this is done, all students will be taught in a manner that addresses their preferences part of the time, keeping them from becoming so uncomfortable that they cannot learn, and requires them to function in their less preferred modes part of the time, helping them to develop skills in those modes. At Estonian Centre for Engineering Pedagogy Felder-Silverman learning and teaching style model for engineering education is used as the basis for the instructional design.

Teaching and learning engineering demands superior teaching competencies of educators. The subjects comprise specialized theory in the respective field, laboratory work and practical training in the workshop; these can be high-achieving learning environments for all students, where the most advanced curriculum and instruction techniques combine to support learning.

Technical teachers are usually highly qualified in the field they work in, they have enough experience which enriches their lessons, are able to provide students with practical examples. But they often lack education in teaching profession. These and other factors led to establishing education in this field. A highly specialized person often concentrates on the topic not taking account of the basic rules and principles necessary to be applied in all phases of the educational process starting with handing on information to students, practicing and testing new knowledge, motivating students during the whole process, choosing appropriate methods and forms etc. Each of these phases contributes to the whole process in a special way – none of them may be omitted. If so, it influences the quality of students’ knowledge.

References


Raising the professionalism of teachers? Content elements for post-initial Master’s level programs

Marco Snoek, Hogeschool van Amsterdam, The Netherlands

PAPER FOR THE TEPE CONFERENCE 2010. TALLIN, ESTONIA

Introduction
In the European policies to increase the quality of teachers, much attention is given to the upgrading of qualifications. The Bologna process has created a higher education area with qualifications at the Bachelor’s and Master’s level. This has lead to a growing variation in Master’s level programs in all higher education areas including teacher education.

As a higher qualification can contribute to an increase in the quality of teachers, many member states use the possibility of Master’s programs to raise the overall qualification level of teachers. However, the strategies that are used by member states can differ.

In a response to the Commission’s communication ‘Increasing the Quality of Teacher Education’, several member states have decided to raise the minimum qualification level to the Master’s level. In other countries the initial qualification level for (part of the) teachers remains at the Bachelor’s level, while new post-initial courses are developed to create in-service opportunities for teachers to raise their qualification level. Although this second strategy, focusing on in-service Master’s qualification programs seems less ambitious then the first strategy aiming at ensuring a Master’s qualification for all new teachers, the second strategy is important as it focuses on all teachers that already work in schools.

In European debates on teacher education, e.g. within the context of the Education & Training 2020 program, discussions about the qualification level are mostly restricted to initial teacher education. The ETUCE policy document on teacher education in Europe (ETUCE 2008) does state that the qualification level for all teacher education programs should be raised to the Master’s level, but in the chapter on continuous professional development of teachers, no reference is made to a Master’s level for teachers already working in schools. The Dutch teacher union AOb went one step further, emphasizing in a manifest published in 2006 that every teacher in school should have the right and opportunity to follow a qualification course at Master’s level during his/her career (AOb 2006). But still this manifest left the initiative to individual teachers and did not outline a policy strategy on raising the qualification level of all teachers in schools.

The need to include teachers working in schools in the policies to raise the qualification level of the teaching profession, is underlined by the findings of the TALIS survey, where teachers reported ‘qualification programs’ and ‘involvement in individual and collaborative research’ as the professional development activities with the highest impact on their development as a teacher (European Commission 2010).
From this perspective, there is a need to take a closer look at in-service Master’s qualification programs, at existing arrangements and programs, at their focus and their impact on the professionalism of teachers. As the start of a wider study on in-service Master’s level qualification programs, this paper will analyse issues that need to be taken into consideration in such a study. The first part of the paper will focus on issues with respect to the conditions for successful in-service Master’s level qualification programs. The second part will focus on issues with respect to the content of in-service Master’s level qualification programs. In this part we will focus on qualities that need to be included in in-service Master’s programs that aim to contribute to the wider professionalism of teachers. This will be done through an analysis of sociological literature on the concept of professionalism. The paper will create a frame of reference for a comparison of in-service Master’s programs in Europe with respect to their contribution to the professionalism of teachers.

Time, Money and Motivation: conditions for successful Master’s level qualification programs for teachers in schools

The European policy focus on initial teacher education at Master’s level can be understood from the fact that organizing initial teacher education at Master’s level is less complicated than in-service programs: students are not yet employed at schools, so there is no complicated balance between study and work, or, in the case of school based programs, that balance is an integrated part of the curriculum.

This is different for in-service programs; teachers are employed at schools. In-service Master programs need a large investment of study time (typically 60 or 90 ECTS in part time programs spread over 2 or 3 years). To be able to invest that study time, three options (or a combination) are possible:

- A reduction in teaching hours. This creates a problem for schools as the salaries will have to cover ‘non-productive’ time, while the remaining teaching hours need to be covered by replacement teachers that need to be paid. Another complication within this option are confliction schedules when study activities coincide with teaching schedules.

  *It is essential for teachers’ continuous professional development to be planned in such a way that their absence from school does not have negative consequences for pupils and/or colleagues. (...) A fully qualified substitute teacher must take over the classes in their absence.* (ETUCE, 2006, p. 46)

  Within the TALIS survey, conflicting schedules are reported by teachers as the principal cause of unfulfilled professional development demands.

- A reduced contract. This creates a problem for teachers as it will imply a reduction of salaries. Many teachers will not be able or willing to accept a reduced salary.

- A reduction of leisure time. In this option, the teacher will concentrate study time in evenings and week ends. This option might work for some teachers but not for all, as in many cases the responsibilities of teachers (in assessing student work and preparing lessons) already extends into the evenings and week ends and teachers have private obligations (e.g. towards families with up growing children).
Example: School based in-service Master’s program University of East London

To solve the dilemma of study time, the University of East London has developed an in-service Master’s program which is focused at a school team as a whole. The program is run at the school location in such a way that the lectures and learning activities coincides with regular team meetings. In this way the program does not disrupt the schedule of the school and the team meetings will get a strong focus on collaborative learning.

A second issue is the costs of qualification programs. A full Master program is expensive. Again the costs can be covered in different ways.

- In government funded Master programs, the government covers the costs for the program, either by funding the university, by funding the employer who pays the university or by funding the teacher (who then pays the university a course fee)
- In many countries, professional development of school staff is an integrated part of human recourse management and considered as an important element of school development. In such cases, schools cover the costs of professional development activities (while the government funding of schools also includes implicitly or explicitly a special professional development budget).
- Finally the costs of qualification programs can be covered by the teacher him/herself. This asks a financial investment from the teacher, while in return it might lead to a change of job or a raise of salaries.

In many cases the financial arrangement under qualification programs will be a combination of two or three of these options.

Example: Study vouchers for teachers in The Netherlands

To stimulate teachers to take up Master’s studies, the Dutch Ministry of Education has created a voucher system through which each teacher can apply once during his/her career for financial support for a 1 or 2 year post-graduate qualification study. The annual (up till a maximum of three years) financial support covers two elements: the course fee for a maximum of 3500 Euro and replacement costs for a maximum for 160 hours.

In this way, the voucher system supports both the teacher and the school.

From the start in 2008, the voucher system has been very popular. In une 2010, 14.000 were using study vouchers.

An important issue in in-service professional development programs is the motivation of teachers to engage in these programs. Again different options are possible:

- The program is compulsory. The decision on this might come from the local or national authority or from the employer. In compulsory programs the motivation of individual participants might be a problem.
- When the program is not compulsory, the motivation might be extrinsic, because a Master’s qualification might lead to a recognition and acknowledgement of the Master’s level through a raise in salary scale, a change in roles within the schools (e.g. extended responsibilities, senior position, mentoring roles, et cetera) or a change of job (towards other schools, management positions, et cetera).
Finally the motivation for participating in qualification programs at Master’s level might be intrinsic, motivated by a need to deepen one’s knowledge, to improve one’s teaching practice, et cetera).

**Example: Teacher profiles NL**
In 2008 the Dutch Ministry of Education and the teacher unions negotiated the introduction of teacher profiles at different levels, connected to different salary scales. Agreements were made with respect to the targeted number of teachers at the different levels. As school heads lack clear, transparent and objective criteria to decide for promotion of a teacher to a higher profile, many school heads intend to use a master’s qualification as a main selection criterion for promotion to higher profiles.

A fourth issue in professional development activities of teachers is the balance in focus on individual professional development and on school development. While on the one hand individual professional development is intended to raise the competence or qualification of individual teachers, many professional development activities aim at impacting on the development of the school as a whole.

When the focus is on individual professional development, Master’s program can aim at attracting individual teachers. The school context is seen as a context for applying new knowledge to support the individual learning process.

When the focus is on school development, the school is an essential environment for testing and applying new knowledge, assignments need to be negotiated with the school leader and impact of the course will increase when teams of teachers from one school are involved.

**Examples The role of schools in English and Dutch Master’s programs**
In The Netherlands the Board of Secondary Schools has initiated a tender for in-service Master’s programs. The Master’s programs had to contribute both to the professional development of teachers and to the innovation agenda in the schools. Underlying the Master’s program is a three way agreement between the university, the student and the school leader. The thesis research must take place within the school and needs support from the school leader. The Master’s student is expected to bring theory and experiences from the Master’s program into school, to support and inspire colleagues.

The Master’s program of the University of East London takes this a step further by not focusing on individual teachers, but on teams of teachers, creating a strong shared commitment and understanding within the team. As not all teachers might have the ambition to get to the Master’s level, there is distinction between activities focused on the whole team and specialization with a deeper theoretical level and a stronger focus on research for those who want to graduate at Master’s level. The topics of each semester are negotiated between the university staff and the head of the school to create a program that is relevant for the local context of the school.

Finally, both the TALIS survey as the ETUCE policy document emphasize the availability of suitable programs on offer as one of the key conditions for professional development of teachers.
This does also apply for in-service Master’s qualification programs for teachers: these programs need to be available to teachers. This raises the question what the key elements of such programs should be.

The content of Master programs: the secondary role of teachers
In-service Master programs for teachers are intended to contribute to an increase of the qualification level of teachers, thus contributing to an increase of the quality of education. In most countries governments have developed minimum standards for teachers. In-service Master programs intend to exceed the minimum level. This raises the question what direction those added qualities take.

An analysis of minimum standards for teachers in several countries (Snoek et al 2009, Finnish Institute of Educational Research 2009) shows that most standards focus on basis competences in the teaching and learning process, while some standards address competences with respect to collaboration, innovation and reflection. In-service Master courses might on the one hand deepen specific competences that have been developed at the bachelor level or focus on the development of new competences.

In the debates on the roles of schools and teachers in society, the ambitions and expectations from the public and society are high. Teachers are expected to be open and responsive to the needs of their pupils/students, their parents, politicians and society in general, to translate those to educational arrangements and to implement these in their curricula, to collaborate with colleagues, but also to engage the wider community in setting the aims and making the design of teaching and learning arrangements, to account for the quality and outcomes of their performance, to justify their activities through evidence from educational research, to be role models to their pupils and students with respect to transversal competences like entrepreneurship, lifelong learning, engagement in the civil society, etc. These expectations exceed the minimum standards that are formulated in many countries. Teachers are asked to be professionals in the wider sense, who are autonomous in their work, which is based on specialist knowledge, who are committed to and feel responsible for their profession and who account for their quality (Hoyle and John, 1995).

This wider perspective on the teacher’s role is also recognized in the TALIS survey on professional development activities of teachers:

Additional “content” is introduced for the professional development that is more or less integrated in everyday school practice and envisages a broader spectrum of teachers’ functions, which emphasises their role as members of modern professional organisations along with their teaching role. Here, concepts such as the “reflective practitioner” or the “school as a learning organisation” are frequently mentioned and teachers’ roles in “secondary” processes are emphasised. This additional emphasis on secondary roles is also promoted as part of the modernisation of the teaching profession. They include teachers as researchers, as receivers of feedback from colleagues, as innovators, as active colleagues, as collaborators of principals, and as manifesting what is sometimes called “teacher leadership”.(...) These two dimensions – professional development to stimulate the primary process of teaching and learning and professional development in terms of new secondary roles in schools – provide alternative scenarios for prioritising the content of continuous professional development.” (European Commission 2010, p. 191)
Within the context of the wider study on in-service Master’s level qualification programs, we will focus on this ‘additional content’, facilitating the ‘secondary role’ of teachers in schools.

The main question in the second part of this paper will try to answer what qualities are needed for this ‘secondary role’ and which should be covered in Master programs that focus on that secondary role.

As the elements of that secondary role have much in common with Stenhouse’s and Hoyle’s concept of extended professionalism (Hoyle 1975, Stenhouse 1975), we will answer this question by analyzing the concept of professionalism.

**Analysing professionalism of teachers**

The study of professions and professionalism has a long standing tradition in sociological research from the beginning of the 20th century (Evetts 2006, Crook, 2008). Sociologists have tried to identify the specific values that are connected to professions and at the same time tried to identify criteria to separate professions from other types of occupations. As in most debates on professions and on professionalism the characteristics of professions are connected to positive and prestigious elements, many occupations have tried to identify their professionalism, thus trying to become part of the elite.

This applies also to teachers. In many publications that are focused on teachers, the use of the term educational professional is used deliberately to indicate and emphasize the prestige and status of the teacher. Teacher policies are full of ‘professional standards’, ‘professional development’, ‘professional communities’, etc. In many of those publication it is unclear whether the concept of teacher professionalism is considered as an indication of the status quo or as an ideal concept that is worthwhile to strive for.

As a result the concepts of profession and professionalism have become diffuse and lack conceptual clarity.

In this paper we will use the following definitions:

- **Profession**: a distinct category of occupational work
- **Professionalisation**: a process in which a professional group pursues, develops, acquires and maintains more characteristics of a profession
- **Professionalism**: the conduct, demeanour and standards which guide the work of professionals.

In the past century, the sociological discourse on professions and on the professionalism of teachers has used different and shifting perspectives, emphasizing different aspects of professionalism (Evetts 2006).

In our study of relevant literature on professions, we have identified five different perspectives on professionalism:

**Archetypes and attributes**

One way of looking at the professionalism of teachers is by comparing them to classical professions like doctors or lawyers and to identify similarities and differences. Using
these professions as ideal examples, typical characteristics were derived which could be used to separate between professions and non-professions and to identify similarities or differences with other occupations. In this approach, the focus is on identifying categories for occupational classification (Gewirtz et al 2009), where the classical professions are considered as archetypes of ‘true professions’.

Typical attributes are (Snoek, Swennen, Van der Klink 2009):

- Professional autonomy, through professional monopoly of the members of the profession who have control over their own work
- Control over entry requirements to the profession and the further professional development of the individual members. Professions also have the power to judge, and subsequently even to exclude, members who do not keep to the professional standards and ethical code of that profession.
- An ethical code that is a means to win the trust of the public and public bodies (often governments) that have the power to license the profession and its members; and to serve as a guideline for good conduct of the members of that particular profession.
- A strong academic knowledge (Abbott 1988), formal knowledge or technical knowledge (Goodson & Hargreaves 1996). “Academic knowledge legitimises professional work by clarifying its foundations and tracing them to major cultural values. In most modern professions, these have been the values of rationality, logic, and science. Academic professionals demonstrate the rigor, the clarity, and the scientifically logical character of professional work” (Abbott 1988, p54).
- Freedom of establishment. Members do not have a job contract but are independent and self employed.

When the teaching profession is held against the framework of characteristics of the classical professions, the conclusion is clear: teaching can not be regarded as a true profession. Teacher do not control the entrance to their occupation, they have no freedom of establishment, but are employed by schools. As a result teachers have only limited autonomy over their work. In many countries there is no ethical code for teachers. Also the academic level of the teaching profession is considered by many authors as limited (Verbiest 2007). It is still relatively rare for teachers to be research trained and/or to have carried out post-graduate studies (Erixon, Frånberg & Kallós 2001). As a result, teaching, like nursing, social work and librarianship, is often called a semi-profession (Etzioni 1969).

Although the fact that the traits approach is widely used in debates on professionalism, the approach is also criticized. Professionalism defined in this way is seen as an artificial construct with always contested definitions (Crook 2008), a shifting phenomenon reflecting whatever people think it is at a particular time (Hanlon 1998). It seems more useful to explore the characteristics to the teaching profession today, than comparing it to some proposed ideal (Whitty 2008).

The professionalisation project
A second way of looking at professionalism is by strengthening the ‘professionalisation project’ (Larson 1977) with the emphasis on the development of a professional body that restricts the entrance to the profession, thus creating and maintaining a monopoly
position from which the profession can safeguard its quality and be involved in debates about power, influence, status and bargains about working conditions and professional autonomy.

In this perspective, the focus is not on an idealized concept that acts as a frame of reference to judge all occupations that want to call themselves profession, but on the process of growing self-awareness of an occupational group, on professionalism as an aspirational target (Powers 2008).

In this process the focus can be on the development of the knowledge base of a profession, on the improvement of standards for professional performance, on restricting the unlicensed entrance into the profession, the development of mechanisms for self-control and self-accountability and on defining ethical codes to emphasize explicit professional virtues.

Examples of such professionalisation projects can be seen in several professions who have developed their own societies, professional journals and ethical codes like journalists (Crook 2008), teacher educators in The Netherlands (Koster 2002) and in the present development of a professional register for teachers in The Netherlands.

In this approach the characteristics of classical professions are still used as a frame of reference for development instead of judgement.

In discussions on the professionalisation projects, two different perspectives are used, one focussing on idealistic conceptions emphasising specialist and ethical virtues (like trustworthiness, collegiality, service), and another focussing on exclusionary and self-interested aspects focussed on market closure, status and power (Larson 1977), leading to negotiations and bargains with governments over professional mandates, influence, jurisdictional competitions and working conditions. (Gewirtz et al 2009).

The idealistic conception can contribute to the increase of societal trust in a profession, while the critical conceptions can easily lead to the reduction of societal trust in a profession.

High expectations in modern society

A third way of looking at professionalism of teachers is by focusing on expectations in the present day competitive society. Present day post-modern and neo-liberal society can be characterized by a stronger emphasis on economic and technological changes. Economic changes have led to a stronger globalized, market oriented and competitive perspective with stronger central regulations (Gewirtz et al 2009). This changing market oriented context for society and schools has resulted in changes in the expectations not only towards school leaders, but also towards teachers, emphasizing accountability, rationality, competitiveness and control. (Evans 2008; Goodson & Hargreaves 1996; Robertson 1996).

‘Schools (like many other public institutions) have been rationalized, cut-back, made more economically efficient, less of a tax burden and set in competition against one another for ‘clients’.’ (Hargreaves 2000, p168).

In this approach the term ‘new professionalism’ is often used, indicating that the changing context of schools asks for a change in qualities expected from professionals, with a focus on effectivity, accountability, national safeguarding and control:
A strong focus on the quality of work and a stronger emphasis on output requirements.

Public accountability, where teachers have to explicate how their teaching contributes to achieving the intended learning outcomes.

Implementation of standards describing competences and qualifications of beginners and expert members of professions. For the OECD, the development of such standards has a high priority:

‘The overarching priority is for countries to have in place a clear and concise statement or profile of what teachers are expected to know and be able to do. This is necessary to provide the framework to guide initial teacher education, teacher certification, teachers’ ongoing professional development and career advancement, and to assess the extent to which these different elements are being effective.’ (OECD 2005: 131)

Most of these standards have been developed by national governments with limited or no involvement of teachers (Snoek et al, 2009).

Especially in England it has been argued that these features of new professionalism leads to a de-professionalisation of teachers and an over-emphasis on the role of managers (Whitty 2008, Hargreaves 2000).

On the other hand, technological changes imply ‘instantaneous, globalized availability of information and entertainment’ (Hargreaves 2000). The knowledge society asks for other qualities of modern professions:

- Increased attention to the life-long professional development of professionals throughout their careers. It is generally accepted that in our knowledge intensive society, lifelong learning becomes essential for career-long professional development (European Council 2009; ETUCE 2008).
- A focus on new forms of relationships and collaboration with colleagues, students and their parents (Hargreaves 1994, p424). Whitty (2008) not only emphasizes collaborative professionalism between colleagues in the school in professional learning communities, but also ‘democratic professionalism’ including collaboration with stakeholders outside the school.
- Emphasis on improvement and innovation. Teaching is seen as a dynamic and innovative profession, where teachers will need to reflect on their own practice and contribute to the improvement and innovation of the profession.
- A knowledge base that is the result of research, experience and reflection. This feature of professionalism leads to appeals to involve teachers in action research, self-study and practitioner inquiry (Cochran-Smith and Lytle 2009, Loughran et al 2004, Ponte & Smeets 2009, Stenhouse, 1975)

Those seven features characterize the role of professions in a competitive knowledge society with on the one hand collaborative lifelong learning and innovations and on the other hand a focus on accountability with respect to outcomes and control of the quality of professionals through standards.

The logic of professionalism

A fourth approach focuses on fundamental differences between logics in the labour market. Although this approach tries to identify professions and non-professions, it differs from the traits approach as the focus is not on studying manifestations of occupations in order to identify categories to classify occupations, but to search for the
underlying and more fundamental logics that can explain the manifestation of professions and non-professions.

Important work in this area has been done by Freidson (2001). He identifies three different logics, that of the bureaucracy, that of the free market and that of professionalism. Those different logics create different qualities that workers need to operate in each of these logics:

- In the logic of the free market, everyone is free to buy or sell goods and services. Nothing is regulated and customers make their decision rationally, based on financial concerns, emotional concerns and their previous experiences with products, services and providers. Free and unregulated competition will increase innovation and keep prices down. Customer preferences, satisfaction and choice, based on transparent information about quality and costs, determine which and whose service will succeed.

- In the logic of the bureaucracy, production and distribution of goods and services is planned, controlled and regulated by the administration of a large organisation, being governments, private firms or public agencies. The main aim of bureaucracy is to guarantee a reliable and transparent society with equal rights and equal access to all. Rules and regulations must safeguard that each individual is treated in the same way and does not have to depend on personal connections. Each organization ‘is governed by an elaborate set of rules that establish the qualifications of those that can be employed to perform different jobs and that define their duties’ (p1). Planning, supervision and standardisation assure customers the access to reliable services at reasonable costs. This is ensured by managers who control those producing the product.

- In the third logic of professionalism, workers with specialized knowledge have the power to organize their own work. They are privileged and exclusive, customers or managers can not employ anyone else. This privilege implies a system of self-control between professionals which prevents abuse of those exclusive rights, so ‘customers and managers can count on work of high quality at reasonable costs’ (p2).

In Freidson’s perspective, professionalism is connected to a distinct mandate where ‘… an organized occupation gains the power to determine who is qualified to perform a defined set of tasks, to prevent all others from performing that task and to control the criteria by which to evaluate performance. (...) The organized occupation creates the circumstances under which its members are free of control by those who employ them.”(p12). The necessity for this third logic is lying in the fact that certain work is so specialized that its quality is inaccessible for those lacking the required training and experience which makes it impossible for customers to select the best services on the free market. At the same time, the application of the expertise of professions is so much depending on specific contexts that continuous judgement, adaptation and fingerspitzengefühl of the professionals are needed, which makes standardization and bureaucratic control unsuited. According to Freidson, the work of professionals can not be standardized, rationalized and commodified (p17). This is supported by Furlong (2000):
'It is because professionals face complex and unpredictable situations that they need a specialized body of knowledge; if they are to apply that knowledge, it is argued that they need the autonomy to make their own judgements; and given that they have that autonomy, it is essential that they act with responsibility – collectively they need to develop appropriate professional values'. (p. 18-19)

Neo-liberal ideologies have led to a mixing of logics where education, but also public areas like health and social care, has become a commodity where parents and students can freely choose and base their choices on league tables. This has led to a strong emphasis on professional quality of teachers by their employers and managers, leading to imposed professional development schemes from above. Evetts (2009) calls this ‘organizational professionalism’. ‘The effects are not the occupational control of the work by the worker/practitioners but rather control by the organizational managers and supervisors’ (Evetts 2009, p23).

In the eyes of Evetts, the focus on the satisfaction of customers through managerial systems of accountability and audits endangers the trust of the public in professionals while it reduces the time that professionals can spend with clients. Opposite to organizational professionalism, Evetts places ‘occupational professionalism’, which is characterized by

‘... a discourse constructed within professional groups, collegial authority, discretion and occupational control of the work, practitioner trust by both clients and employers, controls operationalized by practitioners and professional ethics monitored by institutions and associations.’ (p23)

Both Evetts, Freidson and Furlong argue that professionals need to control their own work given the ideal-typical character of the knowledge and skills they use and their right of discretion. Teaching asks for professional judgement and the use of professional intuition (Atkinson & Claxton 2000), which cannot be standardized. However, this professional control and occupational professionalism asks for a close interconnection and link between professional autonomy, competence and trust.

**The ethical and altruistic character of professions and the role of trust**

To strengthen this link between professional autonomy, competence and trust, several authors emphasize the moral character of professionalism. In this fifth approach to professionalism, the fundamental ethical and altruistic character of professions is emphasized (Crook 2008, Lunt 2008). This ethical and altruistic character is connected to the power imbalance between professional and client. The role of professionals in their service to clients (like the service of teachers towards parents and pupils/students) asks for professional autonomy, which needs to be compensated by public trust based on the rigorous use of an ethical code.

Therefore the public ‘strikes a bargain’ with the professionals (Lundt 2008) in terms of a social contract negotiated by the state,

*The essence of which is that professions are given greater autonomy than other social groups. They set their own standards, regulate entry into their own ranks, discipline their members, and operate with fewer restraints than the arts, trades*
This social contract creates a professional mandate for a profession. This professional mandate is based on trust of the public and state in the professionals. This trust is grounded in the altruistic character of the professionals. For professionals, the measure of professional ‘success’ is not the gains they win, but the service they perform (Crook 2008). Not the height of their incomes makes the work of teachers worthwhile, but the quality of the learning of their students. This altruistic perspective explains the public criticism of high and excessive incomes and personal career ambitions of politicians, doctors, school managers, etc. The main emphasis for professionals should be on a high level of personal integrity and on service to others, ahead of personal reward. In that respect, the teaching profession could be considered as a ‘calling’.

Several authors have elaborated the concept of trust, identifying different forms of trust, which vary in the way in which the risks are accepted or dealt with (Bottery 2003, Byrk & Schneider 2002, Nooteboom 2006).

The theories on trust show the importance of competence, integrity and dedication of the members of a profession to gain the trust of the public and the state and to justify the professional mandate. The members of a profession have a large responsibility to live up to those expectations with respect to competence, integrity and dedication. This is both a responsibility of individual members of the profession and of the professional community as a whole, e.g. through public accounts of professional practice and outcomes which are based on evidence and research, but also through the use of ethical codes and sanctions that are used within profession. The rigorous use of such ethical codes creates an essential safety net in the power imbalance between the public and professionals.

Trust in dedication of the professional is according to Nooteboom closely connected to empathy of professionals for their clients. In the relation between the professional and the client or the society, the development of a shared understanding of professional practice is important. The professional plays a key role in creating this shared understanding.

Bottery stresses the need for professionals to engage in the debates on new policies, not to question the right of politicians to set new policies, but to confront them with the effects of those policies on the level of implementation.

The contribution of in-service Masters to the professionalism of teachers
From our study of the literature on professionalism, a number of essential elements come up. Although the five perspectives on professionalism of teachers differ, they also add to each other providing in the combination a richer and more complete picture of the essence of professionalism of teachers.

In the classical perspective on professions, four essential qualities are emphasized:

1. Professional autonomy, through professional monopoly, control over their own work and freedom of establishment;
2. Control over the entrance to the profession;
3. Control over the central values and good conduct within the profession through the use of ethical codes, connected to sanctions for breaking the code;
4. A strong academic knowledge base that underlies professional activities.
The perspective of the professionalisation project underlines these qualities by stimulating the development of clear entrance criteria to the profession, an explicit knowledge base, ethical codes and elements of self-control and self-assessment and
5. (Development of and membership of) professional societies that can take the responsibility for these elements.

The perspective of professions in present day post-modern and neo-liberal society have emphasized new elements:
6. Public accountability for outcomes of professional performance;
7. Lifelong professional development of the members of the profession;
8. Collaboration with colleagues and stakeholders;
9. Involvement in innovation of the profession;
10. Involvement in the development of the academic and practice-based knowledge base through involvement in academic research, action research and self-study.

The perspective of the different logics of market, bureaucracy and professionalism emphasizes the justification of a separate position of professionals, where the nature of their work and the expertise needed, makes it necessary to create a special mandate for professions and to grant professions a monopoly to safeguard the public for unqualified charlatans.

However this mandate gives a special responsibility to gain the trust of public and state, emphasizing the ethical and altruistic character of the profession. This trust isn based not only on a trust in competence, but also on
11. A focus on integrity and dedication of the professional

Again the role of ethical codes and sanctions within the profession is underlined. Bottery also underlines accountability procedures that provide evidence of the effectiveness of professional actions and the need of a strong research base for teaching as an instrument to strengthen the quality of professional performance and to account for the choice of interventions that are used within the profession. Trust in the profession can further be strengthened through:
12. Commitment of the teacher to support both the public and the state in their understanding of educational matters;
13. Acceptance of the right of the state to set policies, connected to the drive of professionals to comment on the effects of such policies at the level of implementation.

When these 13 elements are translated from characteristics of a profession to qualities of individual professions, a frame of reference is created that can be used to analyse the contribution of in-service Master’s level qualification programs to the professionalism of teachers:
Elements that to the professionalism of teachers

- **Knowledge:**
  - Thorough knowledge of the subject
  - Thorough knowledge of the teaching and learning process (including being up to date with relevant outcomes of educational research)
  - Thorough knowledge of society
  - Knowledge of policy and organisation in education

- **Skills:**
  - Able to communicate and discuss educational issues with a wider audience
  - Able to account the quality of work to the outside world
  - Able to participate in discussions on educational policy from the perspective of implementation in school
  - Able to conduct research within the practice of schools
  - Able to contribute to collaborative learning of professional communities
  - Able to translate outcomes of educational research to innovations in the classroom/school

- **Attitude**
  - Dedicated to the learning of pupils
  - Committed to the profession and the collective group of professionals
  - Willing to contribute to the collective knowledge of the profession
  - Committed to the ethical code of the profession and the integrity of his/her work
  - Willing to account the quality of work to the outside world
  - Focused on continuous professional development
  - Focus on improvement and innovation of teaching
References


E-learning Quality Assurance System for e-Courses in Estonia

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Abstract
In the area of teacher education, e-learning is rapidly growing both in pre- and in-service mode. In 1999 Estonian universities had only 14 e-learning courses altogether, but by 2004 this number was 350 and increased further to 3576 by 2009. This rapid growth has led to the need to actively disseminate "best practices" among the novice course designers, to identify quality criteria, to create instructional materials on how to build a good e-learning course, and to guide educational technologists, whose task is to support and consult teachers and designers. Starting from 2004 Estonian e-Learning Development Centre, who supervises developments in the e-learning field in Estonia, runs a contest for the title "E-course of the year". This contest created a need to formally state the quality criteria for an e-course in a clear and understandable way. To run this contest and to prepare all the aforementioned materials, e-Learning Development Centre formed a quality assurance task force. The aim of this task force has been:

- To create guiding materials for the course building process for e-learning and blended learning courses, aimed at the teaching staff of higher education organisations and at educational technologists working in many of those organisations. As a basis for this work, task force adapted "Quality Manual for E-learning in Higher Education"[1] that was created in the E-xcellence project coordinated by the EADTU (European Association of Distance Teaching Universities).
- To specify the election process for "E-course of the year" and to publish quality criteria for this process.

The first contest for "E-course of the year", following the finalisation of the quality criteria, was announced in autumn 2008. The whole process was designed as a 3-tier system:
Firstly the courses were graded at the self-assessment level, where teachers assess their own course according to the quality criteria. Secondly, at the organizational level, the importance to the organization and student feedback are reflected on. Third tier assessment takes place at the expert level, where the expert group evaluates the course according to the quality criteria.

In prescribing quality assessment criteria, quality assurance task force proceeds from ENQA rules [2]. Main ENQA principles addressed by quality assurance process rules are:
- Responsibility for the quality e-course lies with the university, owner of the course.
- The process of the attribution of the quality label has to be understandable and clear.
- Independent expert groups have to be used.
- Improvement of the whole process (enhancement guiding materials, comprehension of the quality assurance procedure) is regular and based on the feedback of all concerned parties.

In this article we will describe the whole process of quality assurance of e-courses and discuss the experience in Estonia during last three years.

1. Introduction
E-learning is a modern and efficient learning and teaching method, in which several information and communication technologies (e.g. Internet, electronic data carriers, databases, multimedia tools etc) are used for teaching [2]. Until the year 1999 the few enthusiasts from different universities in Estonia had created 14 e-learning courses. Since then, the interest towards new teaching methods and tools has only grown and the number
of e-courses has grown rapidly (see Figure 1). This created a desperate need to spread the “best practice” and create guidelines for creating a good e-course. It also raised the question of how to train and support teachers efficiently. Initially the e-courses were developed only in bigger universities (Tartu University, Tallinn University and Tallinn University of Technology). There was no tradition of collaboration between universities but the need of it in the field of e-learning was very obvious.

To solve the problems of coordination, collaboration and efficient expenditure of resources, the Estonian e-University consortium was established in 2003. Its main task was to coordinate and develop e-learning activities at the higher education level. Rapid development of e-learning caused the creation of the second consortium two years later – Estonian e-VET consortium (consortium of vocational education organizations) which started to coordinate e-learning activities at the vocational education level. Based on these two consortia, the Estonian e-Learning Development Centre was established in 2006. Today, the majority of higher and vocational education organizations belong to these consortia, counting 7 universities, 10 applied universities and 26 vocational schools and covering 95% of all students in higher education. These two consortia provide the means for centralized development and assurance of the quality of e-learning implementation throughout higher and vocational education.

![Number of e-courses](image)

**Figure 1.** Increase of the number of e-courses within e-learning management systems Moodle and BlackBoard Vista, managed by The Estonian e-Learning Development Centre, during 1999 – 2010.

Rapid growth of users within e-learning environments at the same time also indicated the progressive popularity of e-learning as a teaching method (see Figure 2).
Figure 2. Increase of the number of users of e-learning management systems Moodle and BlackBoard Vista, managed by The Estonian e-Learning Development Centre, during 1999 – 2010.

Hand in hand with development of e-learning, three distinct use patterns started to emerge [3]:

1. Fully online learning – the whole learning process (content delivery, information distribution, communication, student assessment) is web-based and there are no face to face meetings.
2. Combined/Blended learning – learning process is mainly web-based but consists also of face to face seminars and workshops comprising no more than 25% of the whole course.
3. Face to face learning with online support – there are regular face to face lectures, seminars and/or workshops which, when combined, account for more than 25% of all learning process. The online environment is used for distributing leaning materials and guidelines, and for submission of homework.

Widespread use of e-learning within different educational institutions brought out several issues for discussion:

- What defines a quality e-course? What are the core quality criteria?
- What kind of cooperation and guidelines are needed for educational technologists to support teachers on a daily basis?
- What kind of training needs to be provided to teachers to allow them to create state-of-the-art e-courses?

To propagate the best practices within the teachers’ community, a contest called “The e-course of the year” was launched in 2004, in which the best e-course was found inside both of the two consortia. To make the selection, a group of experts was formed. This group chose the courses to commend based on general criteria for evaluation, but the assessment was still quite subjective, as there were no tested and reliable forms for assessment. The
award ceremony was carried out along with the demos of the best e-courses during e-learning conferences.

Year after year, both the number of new e-course authors and the number of participants in the contest grew, resulting in a much harder selection process. For the past few years, there have also been additional “special awards” given out alongside the “best course” award. During 2004 – 2007 there were 37 “The e-course of the year” titles and several special awards given to the authors of the courses. The original aim of this contest, selection of individual best courses and dissemination of best practice to the teachers’ community was blurred; there seemed to be no need to pick out the best course to win the contest, but rather to recognize all the numerous teachers who effectively implement e-learning.

Fast-paced development had brought with it the need for clear, concrete guideline and rules, which would support educational institutions and e-learning practitioners in quality assurance. There was a general agreement that activities designed for encouraging e-learning needed a consistent plan and that the contest alone would be too ad-hoc to achieve it. It became increasingly important to connect teacher training and quality criteria and to involve educational technologists in the process of identifying quality e-courses. Time was right to make a change.

### 2. Quality System

In year 2007, The Estonian e-Learning Development Centre established the quality assurance task force, which consisted of members from different universities, all of whom had everyday contact with e-learning.

The main goal for the task force was to specify the process of recognizing the best practice within e-courses. The following smaller assignments were set up based on the main goal:

- To create guiding materials for teachers, lecturers and educational technologist to support design and development of e-courses on a well recognized bases and to create criteria to evaluate existing ones. As a platform guiding material „Quality Manual for E-learning in Higher Education“[2] from EADTU (European Association of Distance Teaching Universities) project called E-xcellence was used.
- Along with guiding materials, the process of assigning e-quality label had to be designed along with a logo for the quality label itself.
- To pilot the process of assigning e-course quality label during the autumn of 2008.

The first version of „Guidelines for creating a quality e-course“[5] was finished in April 2008. Every chapter of this document also contained a list of understandable quality criteria to which a good e-course should aspire. Those lists formed the basis for the next step: designing a transparent process for the attribution of the quality label to an e-course.

In June 2008, in cooperation with the company OÜ Saar Graafika, the symbol of e-course quality label was designed (see Figure 3).

![Figure 3. The symbol of e-course quality label.](image)
e-course was specified along with the necessary guidelines, forms and other documentation.

The process is a three level system:

**Self-assessment level.** Each applicant will make a self-assessment based on a given form. The purpose of this assessment level is to increase the awareness about the acquired quality criteria and to motivate authors to analyze their e-courses.

**Organizational level.** The objective for the organizational level is to gain feedback from organization administration and learners, also based on a fixed review form, which is completed by the person authorized by the organization (e.g. manager of the curricula) and confirmed by the direct manager. Applicant has to submit the organizational review along with the proposal form.

**Expert level.** The expert level assessment, as the name hints, consists of evaluation by a group of e-learning experts (a third objective party). This level concludes with the decision to either recognize or not recognize the course with the quality label. Evaluation on the expert level takes place after the authors submit the self-assessments and organization reviews, and is also based on a pre-determined form.

Throughout the development of this process, there were rules of ENQA (European Association for Quality Assurance in Higher Education) [4] which were considered as a basis for the work done. The main principles considered were:

- Responsibility for offering a quality e-course lies with the educational institution;
- The process of applying for a quality label has to be understandable for all parties (lecturer, institution, expert);
- Evaluation of the courses has to use external expertise;
- Improvement of the whole process has to be regular and based on the feedback of all concerned parties.

### 3. Results, problems and drawbacks

The idea of the quality label was first realised in spring 2008. That year, 36 e-courses applied for and 14 of them received the quality label (see Figure 4). As the materials created by the quality task force were not ready yet, the process was very easy that year: authors presented their courses for the quality label and a group of experts decided which courses were awarded the label.

There were two problems with this process. Firstly, different experts had a different understanding of a good course. Secondly, the decision was not transparent enough for the applicants. If you as an applicant received notification that your course was not worth the quality label, you had no idea why or what was missing from your course. The quality task force therefore had to set up clear criteria for evaluation and to make the process transparent enough so that applicants would receive at least some feedback about their course quality.

Similar process for applying for an e-course quality label, but already considering the feedback from piloting the process, has been followed for the next two years (see the overview of the results in Figure 4).
The whole process follows the 3 tier system. At first, lecturers have to self-assess their e-courses before submitting the application for the quality label. The self-assessment form is similar to the one experts use; these forms give descriptions of relevant core criteria for quality e-courses. To assure e-course quality, there is an emphasis on harmonizing the level of evaluation from different experts.

To evaluate and make adjustments to the implemented process, the feedback questionnaires were distributed to:

- Applicants, whose e-course was recognized with the quality label;
- Applicants, whose e-course did not receive the recognition;
- Experts, who evaluated all the applicable e-courses.

The results gave valuable input to the quality task force to improve the guiding materials and the application process: to edit the handbook and evaluation forms. For example, some irrelevant questions were removed from the self assessment document and some questions were reformulated.

There are still marked differences between applicants’ self-assessment and experts’ evaluations in the year 2010 (see Figures 5 and 6).
Figure 5. Self-assessment results from the applicants whose e-courses were recognized with the quality label (2010).

Figure 6. Self-assessment results from the applicants whose e-courses were not recognized with the quality label (2010).

This discrepancy demonstrates that authors of quality courses understand quality criteria better than those authors, whose courses have not reached the quality level. This discrepancy gives the idea to prepare a e-course for authors, which introduces the process of applying quality label for e-courses and gives more specific instructions on how to carry out self-assessment.

Even though educational institutions give good reviews at organizational level about the courses, some adjustments and concretizations need to be introduced on this side of the process.

In 2010, the handbook „Guidelines for creating a quality e-course“ was also published on paper [5], having previously been available only in the web. Due to the rapid development of e-learning, the web-based material is updated each year; e.g. there is now an ongoing
process of collecting practical examples to illustrate different chapters of the handbook and plans to add two new sections, one about active learning methods and another about improving students’ study skills.

4. Conclusions

The quality assurance task force specified the three level election process for "E-course of the year" and published quality criteria for this process. Task force created guiding materials [5] for teachers, lecturers and educational technologist to support design and development of quality e-courses. The process of recognition is now, after suggested improvements by piloting, smooth and understandable for both the applicants and the evaluators.

The quality label functions as a guarantee for learners that these courses are well structured and those teachers will support the development of students throughout the course continuously. It also gives recognition to the lecturers and educational technologists for the good work put into creating a high-quality e-course.

The process of improving the quality assurance process according to the ENQA rules [4] is going on. New versions of the quality manual, rubric for self assessment and other materials will improve continuously.

Literature

Collegial support groups for teachers in changes: the case of transition to Estonian-medium instruction in Estonian Russian-medium schools

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Introduction

In the post-soviet societies the teachers have experienced how political decisions and ideological transitions may change the routines and relations in schools. The teachers in Estonian schools with Russian as the main language of instruction (currently comprising about a fifth of the Estonian pupils) have had to adjust with changes on different levels – on the individual (e.g. cultural identity, language knowledge), organisational (the schools’ organisational culture), as well as on the social level (e.g. educational policy and ideology). (Masso and Kello 2010b)

Since the 1990ies, besides the paradigmatic changes in educational approaches, one of the more remarkable challenges for the Estonian Russian-medium schools has been the transition to Estonian-medium instruction. In fall 2007, it became compulsory at the upper secondary (gymnasium) level and should be completed (i.e. 60% of the instruction should be in Estonian) by the school year 2011-2012.

The transition has caused distress among many teachers because many have doubts about the general purpose and well foundedness of the transition, and feel insecure about methodical issues (cf., e.g. Kirss and Vihaemm 2008, Kello et al. 2009). Also, teachers complain about in-service trainings that consist of generic declarations and information, and give new standards, but neglect the teachers’ personal questions and problems that are acute at the particular moment. At the same time it seems that open discussion of the problems is
not considered acceptable by the teachers involved – neither within the school nor in public (Kello et al. 2009). Hence, more flexible, individual teacher centered, and at the same time confidential ways to support and mentor the teachers are needed.

In this paper we present and analyse our experience with four teachers’ collegial support groups that were piloted within the research project „Russian Child in Estonian general education School“ by Tartu University Centre for Curriculum Development and Educational Research (financed by Estonian Ministry of Education and Research) from September 2009 to May 2010.

We analyse the support groups from the perspective of the group processes, functions, and possible effects. To introduce our presentation, we first briefly describe the context of the support groups – the transition to Estonian-medium instruction in the Russian-medium gymnasiums – (section 1), as well as the pilot groups on the backdrop of the generic concept of collegial support (section 2).

1. The transition to Estonian-medium instruction in Estonian Russian-medium schools

The transition to Estonian-medium instruction became compulsory at the upper secondary (gymnasium) level since fall 2007. Estonian literature, social studies (citizenship), geography, music, and Estonian history have to be taught in Estonian by the school year 2011-2012. In addition, the schools have to choose other subjects to be taught in Estonian so that instruction in the Estonian language constitutes at least 60% of the instruction by the school year 2011-2012.

The initial educational reform, as well as the underlying Estonian Integration Program, was carried through ethnic Estonian and nation-state discourse. The year 2000 was initially set to be the year of compulsory transition to mainly Estonian-medium instruction in Russian-
medium upper secondary schools by the Estonian Parliament in 1993, seeing the transition as part of a broader decolonisation of the Estonian state. As a result of changes in the general political discourse (i.e. the fading of ethnic nation-state discourse) during the 1990’s, in 1997 the start date of the transition was pushed back to the 2007.

By the Estonian Ministry of Education and Research (the main institution in Estonia for preparing and implementing the reform), the main purpose of the reform is said to be the development of the knowledge of the official language among non-Estonians in order to widen their opportunities for further study, improve their ability to compete in the labour market and thus assisting their integration within Estonian society (see, e.g. MER). In fact, there are a number of other reasons also, such as the attempt to better integrate the Estonian general education system and the more pragmatic attempt to economise the state’s financial resources (expenditure on teaching materials, teacher preparation) in face of the decreasing number of pupils. The public discussion in Estonia on the topic of Russian-medium education has been divided along sociolinguistic lines in Estonia, and restricted by the lack of trust and openness from all sides of the discussion (cf. Kello et al. 2009). For example, just after the compulsory start of the transition, it was supported by 92% of ethnic Estonians and 51% of the Estonia’s Russian-speaking population (Proos and Pettai 2008). There have been widespread worries among Estonia’s Russian-speaking population that the change of the instruction language may cause a deterioration of the Russian-speaking pupils’ learning outcomes (e.g. TNS Emor 2006), and many teachers feel insecure about methodical issues as well as their subject knowledge and skills in Estonian. (Many teachers who are competent in Estonian have started to teach new subjects, while others have started to teach their own subject in another language.) A lack of teaching materials and didactical devices, as well as appropriate in-service trainings is also still intensely felt. (cf., e.g. Kirss and Vihalemm 2008, Kello et al. 2009, Masso and Kello 2010a)
2. The concept of collegial support groups

Collegial support groups (CSG) or peer groups have been used in teacher education programs for several decades (Wilson 2004), but they are not too widely spread in post-soviet countries. Based on the assumption that peer groups are efficient tool for the people in transition or crisis, we combined the basics of reflexive learning, group dynamics and social-constructivist learning paradigm, and created a variation that considers both teacher’s emotional distress in state of partly forced-upon changes, and the process of changing the language of instruction.

We assumed that teachers do not need so much new knowledge as they need support in the process of implementing new language of instruction and, possibly, the new teaching methods. There are several advantages of collegial support groups over the lecture-based training. **First**, peer support group demands and enables more active participation than lecture and, consequently, increases the feeling of control over the processes of change. **Secondly**, small groups provide possibility to get immediate peer feedback to the lesson plans and teaching materials that participants have created. **Thirdly**, the collegial support group helps in reflecting on personal experiences and enables friendly atmosphere that is needed to enhance learning in the emotionally and ideologically loaded situations (Nichols and Jenkinson 2006).

The collegial support group is a singular or „tailored“ form of teacher training which is designed case by case. Each process should be planned individually, based on the defined needs. There is a colourful variety of support groups in different fields that may be used as a resource for particular CSG: professional or personal growth groups, different branches of therapy, supervision, mentoring, coaching, learning-by-doing communities etc. Methodology of all the support groups usually develops in the process as the result of many variables such as cultural background, group’s goal or reason of gathering, resources, participant’s experiences and feedback etc. Based on former experience of the first author of the present
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paper and on the experience of CSG described below, we suggest that following elements of
group process are considered carefully in the process of planning.

**Time.** Since learning from own experience is a process, not a single event, the support
groups usually work together for longer period of time (in different settings 2–24 months),
which helps to build trust and stability. Setting the ending point to the process, however, helps
to define the process and avoid learned helplessness. (Defined ending is used even in the
support groups that have no obligation of professional growth and focus on emotional support
only, e.g. grief groups or support groups of crime victims.) Besides the length of the process,
frequency of meetings also plays a role. The pace of meetings of the CSG should be balanced
with the actual working pace of participants. Too frequent or too infrequent meetings will not
support the learning process; yet, in many cases it may be difficult to find the pace that suites
to all the participants the same.

**Group members.** It is advisable that collegial support groups are open for members
that are not each other’s direct subordinates or supervisors, and that the group’s size is
between 3 and 7. Motivation of each group member is important and methods of recruiting
must be taken into the consideration. For example, if some members of the group are
participating because they are told to by their principal, and/or if they interpret the
participation in the support group as a punishment of being a poor teacher, they may need
considerable help before they find the inner willingness to learn or to change some elements
in their teaching process.

**Confidentiality and communication.** There are several different traditions of
confidentiality in the group work that is aimed towards professional and personal growth. In
extreme cases even the fact of participation is considered to be confidential (for example the
movement of AA). This model does not suite for teachers’ support group, which aims towards
visible changes in the teaching process. However, some confidentiality is needed, since in the
group there should be possible to discuss one’s bad experiences, frustration or fatigue. If the
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group members do not trust each other, they may keep this kind of information to themselves and thereby compromise their possibilities to get support from the group. One should feel free to express oneself in the CSG without the fear of being exposed to larger auditorium. In the terms of informational self-regulation, CSGs can be understood as semi-public situation that has certain rules about how the discussed issues are communicated outside of the group. Defining and keeping adequate level of confidentiality may be challenging throughout the process. Yet, since education is collective process, it is advisable to share some results of CSG with colleagues in order to avoid misunderstandings or creating unnecessary cliques amongst teachers.

Leadership and responsibility. CSG can be implemented in many ways and forms, so the need and role of formal leader may vary. In different traditions and settings, there may be a supervisor, moderator or mentor, or groups may work purely based on group member’s competency and motivation. It is also possible that leader participates in some CSG sessions, while group members carry out other sessions.

Planning and spontaneity. If the emphasis is on the interpersonal emotional support, the planning is rather loose, leaving more space for participant’s own experiences. In situations where support group has an additional aim (usually learning new skills, implementing certain methods, in described case changing the language of teaching), the process needs clearer, but not too rigid planning.

Within the context of general education schools, collegial support groups are rather new in Estonia. Other forms of teacher’s group work (different committees, planning groups etc.) are more familiar in the schools with democratic leadership models. As for in-service training, mostly the teachers have attended general training events on teaching methods, subject teaching, and subject content (Masso and Kello 2010a, 24) that have been designed for larger groups.
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Also, close cooperation among teachers, especially among teachers from different schools, is not widespread in Estonia: while over 20 per cent of teachers from upper secondary schools (gymnasiums) with Russian as the main language of instruction admitted to cooperate ‘often’ with colleague(s) from their own school, only 7 per cent admitted that they did so with colleague(s) from other school(s) (Masso and Kello 2010a, 22). Also, probably due to the lack of such experience, the teachers seem not to be very well aware of the benefits of such cooperation or other forms of collegial support – while answering an open question about what kind of state support was needed to support the transition to Estonian-medium education, only five of 466 respondents mentioned mentoring, counselling or teachers collegial support (Masso and Kello 2010a, 110).

3. The pilot groups

3.1. Aims

Most generally, the aim of the pilot groups was to connect researching and supporting teachers – the groups were used at the same time as a supporting measure and as research instrument to study the conceptions, attitudes, experiences and problems of the teachers within the transition process. The idea of the support groups was based on the consideration that the problems that arise in connection with the transition to the Estonian-medium education (as any problems connected to educational changes), are not caused solely by the lack of appropriate knowledge, skills and experience, but are also affective and attitudes-related. The traditional modes of in-service trainings are not always helpful in such situations since the teachers’ concerns may vary considerably, and at each stage of concerns the teacher needs – and is capable to appropriate – different types of information and support (cf., e.g.,

1 Most often, the teachers asked for more teaching and learning materials (textbooks, teachers books, etc. – 30%), and support in improvement of their qualifications either regarding Estonian language skills, teaching methods or subject content (altogether 46%, ibid.). At the same time, correlation analysis revealed that teachers who were more satisfied with in-service trainings and collegial cooperation were also more satisfied with themselves as teachers (ibid., 26).
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Hall and Hord 2006). Thus more interactive, reflexive and flexible learning environments are more adequate in such situations.

It was considered that collegial support groups would allow to account for the participants’ starting position (incl. Preparedness for change) and speed of thinking, working, and changing, as well as provide a safe and confidential environment for the participants’ (self-) reflection. The moderator (A.Valdre) was expected to intervene as coach or moderator of the group processes (rather than a trainer, teacher or instructor), and the knowledge and abilities of the participants (rather than those of the moderator) were expected to form the basis of the group work. This way, the groups were expected to provide an environment that supports developing individually appropriate practices (habits).

More specifically – from perspective of the participants – the aims of the collegial support groups were to

- help them to support each other in preparing Estonian-medium lessons and in working through parts of the subject’s syllabus,
- encourage them in using active learning methods,
- encourage them to develop their vocabulary in Estonian,
- improve their skills of planning their work and self-analysis,
- give them experience of structured collaboration with colleagues and supporting them in developing their collegial support networks for future.

3.2. Overview

During the school year 2009/2010, there were altogether four pilot groups, two of which met from September to December 2009, and two from February to May 2010; seven times each, plus two introductory meetings in autumn. The teachers who participated in the groups, were teaching of preparing themselves to teach social studies (citizenship) in Estonian.
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The subject *citizenship education* was chosen since this was one of the subjects that was among the first subjects to be taught in Estonian in all Russian-medium gymnasiums, but had not received as much attention, from the perspective of second-language-medium instruction in Estonia, as some other Estonian-medium subjects such as Estonian literature and music. It is also a societally sensitive subject – especially for minority learners – and its content needs permanent updating due to its topicality.

One of the two groups that were formed in September 2009 met in the Northeast Estonian town Narva, and the other met in the capital city Tallinn – thus two sociolinguistically different regions of Estonia were comprised in autumn 2009. However, based on the greater interest of teachers at Northeast Estonia, in spring 2010 both groups were formed there: one in Narva and the other in Jõhvi. The participants were found via personal contacts of the moderator (a history and citizenship teacher herself) or school leaders (information about the groups was sent to all schools in the respective regions in autumn 2009). As a result, in autumn, the Tallinn group comprised three and the Narva group five teachers; in spring, both groups had four participants (altogether 14 individuals since two Narva teachers attended both autumn and spring groups).

Among the participants, there were three teachers whose native language was Estonian (one history teacher and to teachers of Estonian as the second language) and three teachers who’s principal subject was Estonian as the second language. The others were history and citizenship teachers who had previous experience of teaching the subjects in Russian. (Some of them were only planning to teach the citizenship in Estonian in future, while others taught the subject in Estonian (or bilingually) during the school year.)

Each session centered on discussing and conceptualising a topic from the subject’s syllabus. The work was supported by a wiki type website where the teaching and learning materials were uploaded, accessible to the members of all the groups. The participants also wrote short analytical reviews (reports) on positive experiences or problems they encountered
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– the objects of the reviews were of their own choice (that is, the short reports did not have to focus on second-language-medium teaching).\(^2\) The main difference between the autumn and spring sessions was that in autumn, the teaching and learning materials were prepared in advance by each participant in turn, to be discussed and completed at the session. In spring, the topics were less clearly allocated (all participants were called to think in advance about all topics), and more of the actual preparation work took place at the sessions. Based on the experience of the autumn sessions, using Estonian as the working language of the sessions was more clearly encouraged by the moderator at the first spring sessions, but since many participants did not feel comfortable with Estonian, the sessions were rather bilingual both in autumn and in spring.

3.3. Actual functioning

3.3.1. Participants’ feedback

The participants’ feedback was collected during each group’s last session in December and May as the moderator asked the participants what they had gained from the experience, and by means of short questionnaires.\(^3\)

Generally, the participants approved of the idea and organisation of the groups, and were interested in participating in future groups also. (Some of them expressed the wish that the groups would continue in earlier sessions as well.) First of all, the chance to exchange ideas, experiences and information (including information on teaching methods, places to find teaching aids, events, etc.) was pointed out as the main gain of the groups. Several teachers pointed out the positive and safe environment within the group, and that the common

\(^2\) The reports were intended to support the teachers’ reflection, as well as to enable additional insights into the teachers’ perception of the Estonian-medium instruction. There were no restrictions as to what topics could be dealt with in the short reports – hence situations where the teacher had class management problems and problems with the pupils’ attitudes toward Estonian state as well as positive examples of the teachers’ practice were described. (Indeed, some participants interpreted the task as invitation to present their own ’best practice’ accounts.)

\(^3\) The participants of the 2009 groups received the questionnaire by e-mail about a month after the group’s last meeting. In spring 2010, the questionnaires were filled in on paper at the conclusion of the last sessions.
reflection encouraged their self-reflection. Not being left alone was also important: “I did not have to act only based my own knowledge. I learned on what I still have to work on”. The possibility to exchange concrete materials via the wiki website was also seen as a relief by the participants, although many participants could not actually use them immediately (they did not teach the subject in Estonian yet). By others, the materials that were presented by the fellow participants or prepared during the meetings were used when considered appropriate – when relevant regarding a learning topic or suitable regarding the language skills of the concrete students. In addition, when responding to the short questionnaire, the teachers expressed hope that the groups had laid foundation of a future collegial network.

In response to the question which elements should be preserved in future group sessions, the participants mentioned, for example, the regularity of the sessions; working on and discussing concrete learning topics and active learning methods, as well as the possibility to communicate in ones own (i.e. Russian) language in the positive and supportive atmosphere.

3.3.2. The researcher’s view

The researcher’s position in described CSG was rather distant. The recordings, transcriptions and short reports were collected after most of the sessions had taken place, and the researchers had minimal direct contact with the group members. All the results and conclusions are made retrospectively and have not been communicated to the group members.

In the following sections we will present some of the results that help to understand the possibilities and limits of the CSG. We have chosen three areas of results that demonstrate the responsibility of the moderator in the process: language usage, reflecting of pedagogical thinking, and comfort zones.

**Language usage in the group.** There was a discussion between researchers and moderator about the language usage in the CSG-s. The idea was that CSG-s should attempt to
work in Estonian as much as possible, since the groups’ goal was to support teachers in the switch onto teaching in Estonian. In reality, Russian language dominated in most sessions. Estonian language was used in the process of creating PowerPoint presentations, mostly in order to learn orthography of certain terms. Moderator used Estonian and Russian by turns, but did not confront the group members’ language usage during the process. In some occasions, moderator translated subject related terms, explained some idiomatic expressions or corrected spelling. The moderator’s choice of action was based on her personal observations and professional competency. Rigid use of Estonian would have harmed the open atmosphere of the sessions – indeed, as the participants wrote on their feedback sheets, the possibility to communicate in their own language was important for at least some of them.

Reflection of pedagogical thinking. The process of CSG provided several occasions for reflection of participant’s pedagogical values and habits. As an example, we describe a case where the moderator presented a story that described one family’s life during the economical depression to the groups.

The story “Kalle looses job” was constructed by the first author of the present paper to be usable as a possible frame for many learning themes of the subject citizenship. The protagonist Kalle and his friends studied their possibilities in Estonian/European economical and legal situation and dealt with different ethical problems. The narrative expressed several prosocial values like sharing feelings, entrepreneurship, honesty, social responsibility, optimism, respect towards others etc. Some elements of spoken language (especially emotional expressions) were included; the length of story was approximately 5 pages with the consideration that it creates framework for learning social policy, monetary policy, job market legislation, and many other themes included to the subject Citizenship.

The narrative was read by the members, and evaluated as not suitable for utilising it as learning material with their pupils. The rejection, however, was verbalized indirectly, and indicated how group members were used to deal with themes that came across in the narrative
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– it is clear from the discussion transcripts that their habitual approach was to present generic, schematic and factual information to the pupils rather than to base their teaching on examples closer to the real life. The moderator did not insist on usage of the narrative, and did not deepen the discussion about member’s teaching habits and principles, but left the door open for those who wanted to use the narrative in the future.

The described situation is one of several situations, where the moderator made sensitive choices. On one hand, the moderator had a possibility to deepen discussion with the analytical questions and encourage more accurate verbalization of teachers’ understandings. On the other hand, she had a possibility to ask critical questions about the reasons why participants did not find the narrative interesting. And finally, she could have suggested that participants try some new ways of teaching at least once. Yet she skipped the possibilities and made a choice that probably was most careful, but also most empowering for the participants.

Seemingly, group members did not learn anything new and goals of the CSG were rejected. In Actually however, the moderator made a choice that supported participants, avoided power struggle with the group and probably strengthened group members’ self esteem.

Comfort zones. During the CSG-s it was possible to present teaching materials that were already used in classroom by the participants, as well as to create new ones together. The transcriptions of the sessions indicate that the teachers tended to choose actions that were more likely to lead to positive feedback. For example, when they were creating new PowerPoint presentation together, the roles were selected based on one’s strengths, not learning challenges. Thus the participant who was less experienced in Internet search did not look for the additional information. The group’s work tended to be oriented towards a concrete result, not towards the participating teachers’ learning. The moderator had a chance to encourage group members to try more new things, but she decided not to do so in current process. Leaving the group members into their comfort zones probably gave them experience of success, acceptance and praise – and good power point presentations and work sheets they
all can use in the future. It remains open however, whether forcing the teachers to develop their weaker skills could have been a better solution in the situation.

3.3.3. Lessons from the piloting

Based on the available experience in Estonian schools with Russian as the main language of instruction, collegial support groups can be suggested as a tool to help the teachers to adjust with the changing situation. The planning of CSG must be flexible and based primarily on the participating teachers’ situation, working habits and personality – yet, the expectations of the school owner or society must be considered too. We suggest to avoid direct subordination within the groups, and find the moderator from outside of the school(s) involved. Setting the goals for CSG is rather difficult, as is the evaluation of the results – the Estonian case indicates that even a small change in the wanted direction can take a lot of work.

Collegial support group cannot be used as a tool of pushing unpopular changes if the group members are not motivated or if their motivation is low. However, sensitive moderation can help slowly empower teachers and provide some safe room for taking small steps that reduce the teacher’s reluctance towards the change.

4. Conclusions and discussion

Collegial support group is a resource-consuming, but effective tool in the situations where the main goal is personal and professional growth. CSG may be considered in different phases of teachers’/schools’/education system’s development, when sustainable changes are wanted. In Estonian case, CSG were used to achieve several goals: to support both the administrative change and the teachers who are not convinced about the particular change. This is a demanding and delicate situation that needs skillful moderation. Lack of moderating competency may set limits to the usage of CSG-s in Estonia, and should be addressed in the
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planning processes. We suggest that in future, the regional educational counselling centres could coordinate the resources (information about skilled moderators, founds, etc.) of CSG and help to find moderators. We argue that participation in CSG could be a considerable element of teacher’s training, and should be accountable as any other form of in-service training.

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Haridus, 11-12, 1-7.


Teachers’ collegial support groups


The Quality of Initial Teacher Education in the Tallinn University by the Opinion of Student Class Teachers

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Introduction
Over the past few decades European societies have been facing social, cultural, economic and technological changes and challenges, which have been especially visible and rapid in the former Soviet countries, including Estonia. Education and teaching are the key-elements in the light of understanding and coping with the changes in the society. Therefore the professionalism of teachers and the high quality teacher education are the most highlighted issues in discussions connected with educational reform in Estonia. Due to the many new and rapidly changing tasks and roles teachers are expected to fulfill, substantial improvements and reforms of teacher education are seen as imperative (Green Paper of Teacher Education in Europe, 2000).

The current paper introduces the results of a pilot research the aims of which was to get preliminary information about student teachers' opinions about the quality of initial class teacher education in the Tallinn University in order to overlook the class teacher curriculum.

Short theoretical background
The concept of quality is multi-facial and dependent on the context. Therefore it is almost impossible to form a general definition, which would satisfy everyone involved in the system of teacher education. As an open and dynamic system teacher education is embedded in different spheres with a large number of different participants. Regarding the core issues of teacher education and the teaching profession the participants may have different views, interests and power, including different view and interest about the concept of the quality of teacher education and about the quality of teacher education itself.

One of the most widely spread approaches of the concept of quality among the educational spheres is that quality shows the extent of achievement of the set up goals. The concept of quality can also be explained as corresponding with standards
or as self-improvement etc. (Harvey, 1995; Lomas, 2002; Pukk, 2010; Scott et al., 1996; Tam, 2001).

There are two major interest groups of the quality of teacher education in the Tallinn University: teacher trainers and student teachers. Both of them must follow the standards of the teacher’s profession while evaluating the quality of teacher education (Standard of teacher’s profession, 2005). Teacher education is also regulated by the Framework Guidelines for Teacher Education. The framework guidelines set out general and special requirements for teacher education, novices’ induction year, and teachers’ in-service training (Framework Guidelines for Teacher Education, 2000; General Guidelines for Teacher Education, 1995).

According to the TNTEE (Thematic Network on Teacher Education in Europe) publication “Green Paper of Teacher Education in Europe” (2000), three aspects seem to be of the utmost relevance for the best possible academic teacher education:

- Teachers are supposed to acquire competence to establish powerful learning environments in order to make high quality education and training a reality.
- Teachers should be able to transform academic knowledge into teaching and learning situations in order to make provision of a broad knowledge base.
- Co-operative problem solving and teamwork seem to be indispensable to meet the challenges of teaching and learning.

Overview of the study

The urgent need for changing teacher education is an important subject of discussions in all Europe. Fostering the dialogue between all the parties involved in teacher education and its reform, it’s important to know, how student teachers themselves evaluate the initial teacher education.

Do student teachers find ample opportunities to learn the necessary competencies in the existing teacher education program? Does initial teacher education with its focus on either “the practical” or on number of academic disciplines provide the competencies necessary for transformation processes? Does initial teacher education provide adequate learning environments? These questions were frequently discussed with student class teachers with the aim of getting the first impression on how they evaluate the quality of the initial teacher education in the Tallinn University.
The qualitative research method in the form of free writing was used for getting empirical research data. The main questions that I as teacher trainer wanted to get answer to, were: what do student teachers understand as high quality in their own initial teacher education. What are they or are not satisfied with? Which factors influence student class teachers’ opinions towards quality of their education the most?

**Principles of collecting empirical data**

The 2\textsuperscript{nd}, 3\textsuperscript{rd}, 4\textsuperscript{th} and 5\textsuperscript{th} year students were asked to write freely about their opinions and attitudes towards their studies in the Tallinn University, after short period of discussions about the quality of teacher education in general and in the Tallinn University in particular. Both, the full day (stationary) (2\textsuperscript{nd}, 3\textsuperscript{rd} and 4\textsuperscript{th} year) students and distance learning (3\textsuperscript{rd} and 5\textsuperscript{th} year) students were involved in the study. Participation was absolutely voluntary for students and writings were anonymous.

Altogether 50 writings from 85 possible were collected: 33 from stationary students and 17 from distance learning students. The reason for choosing the courses named above was the wish to find out whether or not completing teaching practice change student teachers’ vision about the quality of education: the 2\textsuperscript{nd} year stationary and the 3\textsuperscript{rd} year distance learning students have not passed school practice yet.

The collected texts were analysed with qualitative content analyse. Students’ statements were divided into bigger categories according to the questions the researcher wanted to get answers to and the theoretical approach (Metsämuuronen, 2007). The basis for forming the categories was found from students’ writings. The following categories were found: a) statements connected with university teachers, b) with didactic subjects, c) with general subjects, d) with practice and e) statements connected with getting more concrete practical hints.

**Student class teachers` opinions about the quality of teacher education**

Before describing the results of the preliminary analysis of the collected data, it would be fair to announce that this is the first attempt for the author of the current study and the presentation to use the qualitative research method and therefore the results are not transferable and valid for deeper generalization yet. But at least it is possible to get the first impression about general tendencies.
As shown in Figure 5, far more than half of the students said that one of the indicators of quality of teacher education is the lectures` professionalism. As all the statements about the lecturers were also counted separately, it can be said that 36 students noted altogether 70 times (average 1.9 statements per writing) something about the named issue. The biggest number of statements in one text connected with the teacher trainers` professionalism was 6.

Statements connected with lecturers can be divided into two subcategories by the content of statement: expressing satisfaction or dissatisfaction. Fortunately our students evaluate the lecturers` professionalism rather highly. They appreciate the lecturers, who have had real teaching experiences or in the other words, who themselves have been as acting teachers, because in this case the lecturer can connect theoretical knowledge with the practical school life and is able to give examples from real life. Students prefer the lecturers, who themselves teach as they speak about how students must teach. Also lecturers` ability of making lectures attractive and making jokes relevant to the subjects is seen as the criteria of professional teacher trainer. Students expect more personal feedback and communication from the lecturers. They valuate highly lecturers’ readiness to listen students’ opinions and to have open-minded bilateral discussion. What they do not like is that a lecturer reads his/her text exactly as it is in Power Point slides. They see it as the total waist of time, because they all can read themselves. The latter was the most named negative opinion about lecturers. Students consider lecturers as the most influencing factor for the learners to
evaluate the quality of education. Rather many students stated that the biggest motivator for learning is *lecturer’s positivism and devotion to her/his job*. The next frequent opinion, showing dissatisfaction with lecturers, was that university teachers *do not cooperate with each other*. There are rather many overlapping themes/ issues within different lecturers’ lectures. That means that lecturers are not familiar with each others' work.

Figure 2 shows that lecturers’ professionalism influences the evaluations on the quality of teacher education the most among younger students: year after year its influence decreases.

![Figure 2. Categories researched and percentage of students who mentioned certain category (by study years).](image)

Next frequent issues named in the students’ writings were connected with general and didactic subjects. These statements were not counted by the researcher, but only marked as showing satisfaction or showing dissatisfaction.

Generally and shortly it can be said that almost all the statements about didactic subjects expressed satisfaction. Students noted that didactic subjects give or have given them *self-confidence and strong bases for coping in everyday school life and in practice*. Despite of this, they are still very interested in getting even more and more specific practical hints. For example: *how to manage with unexpected behavior; to get examples on how an absolutely perfect lesson looks like; strategies for coping in...*
multicultural classroom; to get a lot of ready-made lesson descriptions; to learn how to use modern technical equipments; etc.

Statements connected with general subject, on the other hand, mostly expressed dissatisfaction. Students find that they do not see the connection between some general subjects and practical schoolwork. The most problematic seems to be the overly large number of students participating in these courses: students feel themselves anonymous; they do not feel personal involvement with the subject and the lecturer; they cannot discover, how the subject can help them to cope with real schoolwork; etc. But there were also students, who were rather satisfied with general subjects. As it is seen in Figure 2, the percentage of students satisfied with more general subject is connected with the year of studies: the more a student is aware of the future profession and feels herself being safely and strongly equipped with practical knowledge and skills, the more she starts to evaluate general knowledge and associate these knowledge with real work.

Figure 3. Categories researched and percentage of students who mentioned certain category (by form of study).

The same tendency appears while comparing the statements from stationary students and long distance learning students: the latter are mostly practicing teachers.

Conclusions
The main aim of the study described in current presentation was to get the first notion about student class teachers’ attitudes towards the quality of their education in the
Tallinn University and towards the quality of initial teacher education in general. It is essential for teacher trainers to know, whether or not future teachers in their own opinion acquire competence to establish powerful learning environments during initial teacher education. Whether or not they feel themselves to be able to transform academic knowledge into teaching and learning situations in order to make provision of a broad knowledge base.

The results of investigating student class teachers’ free writings showed that the most visible factor of evaluating the quality of education seems to be lecturers’ professionalism, devotion, communication skills and attractiveness. The next important aspect is the amount and the place of didactic/practical subjects and the balance between didactic and general subjects. It might be useful to re-look the class teacher curricula from this viewpoint.

Lastly: the question about how to present theoretical subjects and knowledge in the manner that student teachers perceived them as an inevitable assumption for being successful in practical school work, is as old as the human kind.

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Introduction

Able of the fact that the quality of teacher education is a matter that must be present in the daily life of teaching professional, we have engaged in the project referred, associating advance research with teacher training, with the aim of promoting quality cultures development. It started 10 years ago and evidences have been proving the great benefits it brings to professional development at several levels – Infant Education to HE. The crucial questions proposed by the program of the Conference will be considered in the papers presented by a small group of the doctoral program students.

We pretend thus to bring a small demonstration of a regional project (North of Spain and North of Portugal) which is in course, questioning the importance of teacher education policy in Europe, the need of mobility, the interchange and the renewal of evaluation cultures in teacher education. The papers will focus on the following aspects:

Developing quality cultures within initial teacher education through Poetry and Images – meta discourses of autobiography and identity, thus leading to reflexion focusing the (re)direction and (re)orientation in cultural poetry and art languages of future primary teachers. (Assunção Pestana)

Creating conditions for the deep changes needed in the teacher’s role as a consequence of the European policies regarding Lifelong Learning – the shift of paradigm from instruction to learning paradigm – the case of quality environments for Adult learners. (Margarida Gomes e Anabela Maria)

During the nineties and early twenty-first century, interest in the quality of teaching has meant to emphasize more on the bureaucratic control of teachers and training institutions than to encourage policies to improve teacher education:

“Whereas, much attention has been paid to mastering instruments of quality control or accreditation in the past decades, the focus is increasingly on mastering change, allowing ownership for individual development, promoting champions in organisations and enabling professionals in higher education contexts” (Hudson, Zgaga and Astrand, 2010:9).”

To improve teacher quality and teacher education is one of the priorities for European Union Member State. The knowledge, skills and attitudes of each of Europe's 6 million teachers are of great importance. After all, the quality of their teaching has a direct effect upon learners’ level of attainment and their learning experiences.
The demands on teachers are evolving and increasing; their roles are changing significantly. It is important that systems for teacher training enable all teachers to develop the knowledge and skills they require, and that they have access to the support they need throughout their careers. (http://ec.europa.eu/education/school-education/doc832_en.htm).

Similar statements we find in the Communication from the Commission to the Council and the European Parliament:

“Improving the quality of Teacher Education is, therefore, an important goal for Europe's education systems if quicker progress is to be made towards meeting the common objectives that have been established under the Education and Training 2010 programme. Ensuring a high quality of Teacher Education is also important, of course, to secure sound management of national resources and good value for money: approximately two thirds of expenditure on schools is allocated to teacher remuneration”.

(…)

As with any other modern profession, teachers also have a responsibility to extend the boundaries of professional knowledge through a commitment to reflective practice, through research, and through a systematic engagement in continuous professional development from the beginning to the end of their careers. Systems of education and training for teachers need to provide the necessary opportunities for this.” (Improving Quality in Teacher Education, 2007: 5).

But, what we understand for quality in teacher education? It is consensus possible on defining teacher and teacher education quality? In the third edition of handbook of research on teacher education, Goodwin (2008: 399) posed the difficulty of reaching a consensus because of the mix of values, norms and socio-culturally specific goals:

“The question -who does or should teach- is an enduring ones in large part because everyone is interested in and concerned about capabilities and qualifications of teachers. However, the heart of the concern is not simply that teachers should be capable or qualified, but what constitutes capableness or qualification. Thus, each constituency comes at the question with different definitions of teacher quality and different ideas about what teachers should know and be able to do, ideas and definitions that are framed by different values, sociocultural norms, and aims”.

On the other hand, we must remember that teacher education has not exactly been an outstanding issue for universities. Its late inclusion in the frame of university in many European countries may have much to do with the disaffection (disdain) of it to the teacher training, a field traditionally considered a minor issue. Perhaps it is interesting to inquire the role that universities play –or should play in the future– in teacher education policy. For Hudson, Zgaga and Astrand (2010: 8):

“In the past, contributing to the development of Teacher Education policy was not a major item on agendas of the universities and institutions of initial teacher education. On the contrary, it was left almost exclusively in the hands of national authorities. Also today, national authorities have their important roles in this domain; however, times have changed and policy development is increasingly understood as an issue of the partners’ involvement and European cooperation”.

In their work about quality in teacher education, Imig and Imig (2007: 96) suggest that the political interest in finding new directions for preparing and keeping good teachers lies in the consideration of student learning as the "key" economic success in the twenty-first century. In this frame of reference, states:

“We will highlight the exclusion of professionals or academics from the process and suggest the need for the community of academics and professionals to reclaim a role and to pose a set of solutions. We suggest that this has to be done at the local level, rather than national level, and that the single measure of success will be student-learning gains of students in local classrooms and schools. Absent such effort, politicians and policy makers… continue to marginalize teacher educators and to assert their own solutions to the problem of attaching, preparing, placing, supporting and sustaining the highest quality teachers in schools everywhere”.
Agreeing with the above quote, it is necessary to pay attention to the difficulties from the poor relationship between the training system, the induction period and professional development of teachers, with the limited role of universities in in-service teacher training, said by the European Commission (2007). We shared with TEPE network “the need to develop a new quality culture in relation to teacher education in its broadest sense at both national and institutional levels”.

In this frame of reflection, it can obviously be argued that teacher educators are to teachers what they are or will be to their students. In the context of teacher education, trainers develop the same attributes that their “students” will do in the different levels of the educational system. In one of the most relevant factors of education being a privileged source for the learning of content, ways of doing, knowledge and attitudes toward teaching, etc. They provide an implicit model of performance that teachers can later reproduce with their students (Montero y Vez, 1990). Moreover, teacher educators have been a neglected factor in the contemporary debate on teacher education (see Snoek, Swennen and Van der Klink, 2010).

Recognizing the important role played by the trainers in the quality of teacher training, we have developed a project which goal has been the professional development of teacher educators. The strategy for doing so has been to involve them in the process of research into their own practice with the expectation of the multiplier effect in the various types of teachers with whom they work.

The voices of the group of trainers who are present with us in this conference, doctoral program students, show their commitment with student learning (university teachers, prospective teachers, and adult learners). The works presented here have in common the concern to research their practice, use new tools for teaching, learning and assessment, including portfolios, and to train professionals to take in their hands a systematic engagement in continuous professional development.

In one case, the subject is aware of the existing double standards at the university for teaching and research and the proposal to make the teaching so valuable and recognized as research, in line with the work on the scholarship of teaching (for example, Ealey, 2000, Elton, 2001; Shulman, 2004). In another, the content deals with the construction of the identity of future teachers of primary education through the work of interdisciplinary art and narrative poetry. The third case puts its focus on cooperative work by demonstrating a paradigm shift in the knowledge society, from teacher centred to student centred learning, preparing reflective practitioners through the use of tools that encourage self-evaluation and self improvement.

Going back to 2000, when we decide to answer the relevant challenges that were arising, aiming at developing a quality culture in the Institute Piaget, Portugal, we considered the training of teachers, especially for the graduate (alumni of the faculty of education) and the teaching staff of the Primary Schools where the alumni develop their training. The action plan was to take place in the Department of High Studies and Continuous Training [DAEFA], in the North of Portugal, at the High Education Teachers Training School, named ESE Jean Piaget Arcozelo/Canelas, in the academic campus of Vila Nova de Gais. The program offered would be extended to other candidates outside the Institute. Several hypotheses came up, envisaged at a short, medium and long term, i.e., and three different situations were thought:

- A makeshift action – momentary and intermittent;
- A 'therapy' – action wider and planned according to the diagnose;
- A solid structured – long and lasting, renewable and strengthened over time.

At the same time, we had to think of the trainers to be involved, according to the different types of situations imagined, i.e., university teachers with different profiles, with differentiated scientific bases as well as with pedagogical and didactic knowledge. Reflecting on the situation and on the possible actions, we advanced with the diagnose that led us to set up the third hypothesis (long and lasting) once that one would respond more fully to the needs detected. In fact, a solid structured program could respond

- To what was pretended: the empowering of teachers and the quality of their teaching;
To the real situation: the wide range of public we wanted to reach.

We considered this was the more serious approach, both in terms of knowledge and of lines of proposed research, as well as regarding the feasibility of the operation in the context, the opportunities for skill development of partnership projects and the possibility of team-work and even networking. To reinforce this idea, the choice we made (the third option) would lead to research projects in parallel and in constant interaction – investigation by itself, and at the same time, the promotion and development of a renovated praxis to be continued by the alumni – teachers or future teachers – involved (Lamas, 2007).

Following up this idea, we were carrying out the recommendations expressed at the conclusion of the study Research on teacher education in Portugal (1999-2004) just published by Estrela, Eliseu, Amaral, Carvalho e Pereira (2005), that urged to think over the continuous teacher training process, thus understanding it as a set of possible interactions and cooperation between researchers, trainers and teachers. Only this new understanding of the question would promote research, reflective practice and professional interactive and stimulate the necessary synergy to develop competencies of all the stakeholders.

Despite of the choice made – the third situation designed –, we were aware that we would also need to implement actions that fit into the other two routes, but not exclusively into those two. No action foresight however greater the range might be, the third route could provide the long term, content and size fit to the other two, thereby giving them an advantage (Lamas, 2007). Such integration would certainly be taken into account during and after the period when the doctoral program in question would last.

We then question ourselves about
- Who will be involved in the preparation of such a program?
- What areas of science will be covered?
- What materials shall we include?
- What partner institutions must be involved?
- …

We were, then, confronted with a task of great responsibility. It required or us a commitment and dedication, time for meetings and making decisions. One person alone could not undertake such a task. So we stared to collect opinions and listened for potential contributors. As for an institution, it came up to our minds immediately the idea of involving the University of Santiago de Compostela, with which the Instituto Piaget already had signed, at that time, a protocol. In our past experience, relationships with the Department of Romance Philology had been very positive, and the idea seemed very interesting and worth of exploring.

We established contact with the director of the Department of Didactics and School Organization [DDOE] of the Faculty of Education at USC and then began a collaboration that proved to be rewarding, both at personal level as well at professional lever. We refer the undergoing work as a job of high quality, a solid and very profitable job supported by all involved in the project. Under the protocol, was born the opportunity of a long lasting partnership – DAEFA/DDOE – at the Institute Piaget, namely in the academic Campus of Vila Nova de Gaia. We are now referring to the doctoral program in Didactics Perspective in Curriculum Areas [DPAC], being coordinated at both scientific and pedagogical didactic level by both of us – Lourdes Montero Mesa and Estela Ribeiro Lamas.

In the context of actions triggered on those days, we are compelled to invoke the one related to the Joint Interim Report of the Council and the European Union Commission on the implementation of the Lisbon Strategy (2004 / C 104/10) Education and Training 2010, where the urgency of necessary reforms for the success of the Lisbon Strategy were presented, identifying the orientation as one of the four key actions to create learning environments open, attractive and accessible so as to
“(...) support learning at all ages and a variety of educational establishments, as well as empower citizens to manage their own learning and their work, in particular by facilitating them not only access and progress in a variety of possibilities learning and career pathways.”

From the first meetings that took place, the DPAC team initiated a dialogue in which the issues we were concerned about came up and the ideas we had for a doctoral program to suit to the reality diagnosed were discussed. The needs were brought up and we reflected upon them. A solid frame was designed in the normative emanating from the Council and Commission of the European Union. A curriculum was then being built in such a way that comprehensiveness and coordination would be achieved between the different selected areas and responded to what was intended in order to provide effective training and promote the quality we were looking for.

The very structure of the program, articulated in two biennium, as the references below show, reveals the preoccupation itself in providing conditions for a journey “in intellectual companionship.”

| 1st biennium | - one academic year with workshops;  
|             | - one year dedicated to research directed by a professor having in view the presentation of a written essay [TIT] to be presented and defend in public session before a jury, thereby obtaining the Diploma of Advanced Studies [DEA]; |
| 2nd biennium | - two years at least, research driven, leading to the submission of the doctoral thesis, in a curriculum area identified at the end of the first stage (after the conclusion of the TIT). |

We underline the importance of monitoring, implemented in the form of mentoring, understood as a mode of teaching and learning, as Pérez Díaz (2006:161) defends: "(…) the student must seek to learn the full maximum and become autonomous in the learning process; he must adopt responsible decisions for his development".

Indeed, during the first year of the program – the curriculum component, this monitoring is done through the presentation of multiple lines of action/research, which already raise some individual response, in terms of area choices that show how each student is intellectually updating his/her knowledge, and respond (or not) in a creative, personal way, committed to the challenges posed by the teachers that streamline the seminars. The academic year is structured/organized along the time gap of one academic year into two major groups – a core curriculum that all students meet– and a specific curriculum area, emphasizing the importance of qualifying for the performance of professional activities, specifically teaching and research and not simply with the purpose of over-providing information.

The first block, common to all students, comprises a series of six workshops, five of which are required, each representing a seminar valued in three-credit. So students will count in this area, a total of fifteen credits, that is, one hundred and fifty hours lessons.

The importance of this multidisciplinary training, on Teacher Education, is highlighted in the following statement –Order No. 13 766/2004 of the Minister of Science and Higher Education, under the direction of Pedro da Ponte (December 2004)– under the Bologna Process Implementation at national level

“Teaching, whatever the level at which it is exercised, is marked by a common professional knowledge, resulting from mobilization, production and use of several knowledge (scientific, pedagogical, educational, organizational, technical and practical), organized and properly integrated into function of concrete action in each situation to develop professional practice. Thus, whatever their level of education and teaching their specialty, every teacher must have completed a multi-faceted and therefore multidisciplinary.”
A project such as the one we have outlined, takes into account all its components seriously. We felt it was no doubt an ambitious project, requiring highly qualified faculty professors. This was therefore another task that the elements of the coordination had to undertake. Efforts were made as we knew that professional expertise was needed. Professors form the Department of DOE-USC contributed, mobilized knowledge in the various seminars – the common core of the curriculum. From DAEFA were invited in addition to the IP teacher's team, professors of the Faculty of Psychology and Educational Sciences of the University of Porto, of the School of Education of Porto, Faculty of Arts of the University of Coimbra and Faculty of Human Kinetics, Technical University of Lisbon.

This doctoral program integrates a total of thirty teachers. Component in the curriculum, it is up to each one teaching one to three credits in seminars regularly throughout the first year. Still in the 1st biennium, considering the implementation of research, some elements of the faculty are called upon to assume the responsibility, guiding the students in carrying out research in order to obtain the DEA.

In the 2nd biennium – the draft of the thesis –, the student may request the guidance of two professors of the program team or a professor of the program and another outside the team. At this stage, according to the initiative of the coordinating council of the program, another Seminar – sharing progress and difficulties – was introduced permitting to share regularly the ongoing happening thus allowing to create opportunities for dialogue among students who are doing research in related areas as well giving the opportunity to reiterating ideas, enhancing training teams of people with different skills and abilities, to create structures for cooperative learning and encourage the active solidarity between group members, in practice, socially relevant and conducive to the development of other qualities like the ability to listen (Tedesco 1995).

The Seminar-sharing takes place, usually over a day, lasting eight hour. In the first part, with the presence of one of the research leaders, doctoral students are encouraged to summarize the work that they have developed, their worries and concerns, referring the accomplishments and successes satisfactory. On the one hand, they may so discover pertinent bibliography to the subjects they are inquiring; on the other, common concerns emerge and they feel encouraged to continue and maintain a teamwork or networking. We say that tutoring is here not so much the specific field of teaching, but more the scope of pedagogy allowing performance much better in terms of helping to consolidate skills.

Those who have finished their doctoral studies in this program have already taken the opportunity to share their work with fellow doctoral students, reflecting on the entire journey they made. This initiative aims to encourage colleagues still in the phase of preparation of the DEA essay or the doctoral thesis as well as to contribute to the presentation of lines of research work, overcoming some constraints, felt during this period. It has been an exchange of rich experiences.

The second part of the Seminar-sharing, with the presence of two or three professors of the program, according to their curriculum areas and the areas of research of their students, discuss some topics focusing particular curriculum topics – those that permit to strengthen aspects of the lines of ongoing research. Naturally two or three groups are formed according to the areas in which the doctoral research is ongoing thus discussing strong and weak points of their work.

This Conference offers us the opportunity to review this retrospective. We reflect on the results already obtained and submitted and the processes that are ongoing. The retrospective has allowed us

- Rebuild the architecture of a project that assumed from the outset seek to meet identified needs in terms of teacher training: a doctoral program;
- Verify the existence of scientific essays resulting from individual research projects – 14 doctoral theses and 38 undergoing;
- Verify the existence of ongoing projects that came out of the research conducted for the doctoral theses;
- Verify the existence of scientific papers in Conference proceedings; the detected papers published amount to 82.

We question ourselves now, as a result of this retrospective, how the doctoral program DPAC answers the big questions of the situation that currently are being experienced in the education world.

In the context of the Program of Work and Vocational Education 2010 (02/14/2002), which constitutes the strategic reference framework for the development of policies for education and training at EU level, we find that we have been contributing to the target than lifted up to be attained by 2010 –education and training in Europe as a world quality reference. In the framework of the Lisbon Strategy, the European Commission put forward the following strategic objectives:

1. Improving the quality and effectiveness of education and training in the European Union.
   1.1 Improving education and training of teachers and trainers.
   1.2 Developing skills for the knowledge society.
   1.3 Ensure that everyone has access to Information Technologies and Communication.
   1.4 Increase the number of people who opt for technical and scientific studies.
   1.5 Making the best use of resources.
2. Facilitate the access of all to education and training in the European Union.
   2.1 Promote an open learning environment.
   2.2 Making learning more attractive.
   2.3 Supporting active citizenship, equal opportunities and social cohesion.
3. Open to outside the education and training of the Member States of the European Union.
   3.1 Strengthening links with the world of work, research and society at large.
   3.2 Developing entrepreneurship.
   3.3 Better language learning.
   3.4 Increasing mobility and exchanges.
   3.5 Strengthening European cooperation.

Making a careful reading of the lines of inquiry, which were drawn in space built for the conduct of the doctoral program DPAC, we found that they fall within the framework outlined by these strategic objectives, insofar as the issues worked out, rooted in theoretical frameworks defined not in the plane of abstraction, but materialized in the study of actual cases in prognostic analysis and actions taken. Moreover, if we look at the levels of education in which the studies have been performed, we conclude that the whole educational system is present, we work within the Childhood Education, Special Education, Vocational Education, Basic Education (1st, 2nd and 3rd cycles), Secondary Education, Higher Education, covering diverse subject areas, issues and the school management. We are now moving in what concerns the 3rd strategic objective, i.e., strengthening links with the world of work and at the same time, through the Erasmus program, promoting mobility and exchanges, not only between Spain and Portugal, but with other countries as well, thus looking forward to contribute to the strengthening of European cooperation.

In turn, each project rooted in the doctoral program PDAC eventually leads to other projects at educational institutions to which it refers. Each student as an educational agent assumes to be responsible for a project contacting, questioning, interviewing other human resources thereby alerting them to the issues identified, hypothetically, implicating them and thus making changes and promoting learning and professional development.

We often lament the absence of policies to promote the quality of teacher education at different levels, institutions and individuals. That is not our case, as we are showing in this work. We have ten years working for the development of knowledge and improving practices of trainers and teachers in pre-school, primary, secondary and higher education. The University of Santiago de Compostela, Spain, and Instituto Piaget de Vila Nova de Gaia, Portugal, two higher education
institutions of two European countries, have a ten years developing a partnership policy. Ten years ago, both university institutions undertook a collaborative adventure of creating and developing a doctoral program entitled "Didactic Perspectives in Curriculum Areas", affectionately known by its acronym: DPCA (I, II, III and IV), since we had four biannual editions of this program.

In some of the results obtained in this work realize through the presentation by its authors of three studies designed and conducted to develop cultures of quality trainers and teachers. The voices of some of the people involved in this doctoral program, well aware of the efforts made in his career as a researcher. There are a few papers presented but many more who embarked on the hard task of facing the challenges of learning of research through the development of their master and doctoral dissertation. Unfortunately, not everyone can be here.

The profound changes that are taking place in Higher Education are having a great Impact on the teaching processes and training of university teachers. Consequently, new curricular structures, student-centred new teaching methods, and new definitions of teachers' work are generating new pedagogical demands, which are unprecedented in the recent history of European universities. Specifically, European Higher Education Area (EHEA) guidelines require a teaching profile that able to promote significant learning, higher thought competences, learning how to learn, and the ability to develop reflexive thought. These challenges represent an excellent opportunity to learn from our endeavours, critically analyze a wealth of experience and wonder about their future paths.

In this context and from an internal assessment approach of this doctoral program, we would highlight the following one most representative features, unique and innovative in its focus on quality in teacher education:

1) First, the complexity implicit in the challenge made by the Piaget Institute at the University of Santiago de Compostela to create a doctoral program to be developed in partnership by both academic institutions. Complexity represented on one hand by the need for a curriculum tailored to individual needs for research training of trainers of the Instituto Piaget and, secondly, the challenge of setting up a teaching team composed of doctors belonging to both academic institutions.

2) Secondly, to highlight the uniqueness of a curriculum based on interdisciplinary between the Knowledge Area of Didactics and School Organization and Specific Didactics (mathematics, experimental sciences, lingua, art education, and physical education). Themes and problems to work at different levels of the education system in terms of training needs in the investigation of candidate (early childhood education, primary, secondary, higher or special education). A singularity highlighted in the flexible curriculum, consisting of common and different pathways of specialization. Thus, we have had the opportunity to experience a rich process of interaction between different scientific cultures, disciplinary, university, in a curriculum design meaningful for participants in its development.

3) Third, to highlight the ongoing dialogue and negotiation of meanings, as the tools par excellence to address and solve problems, discuss differences, suggest improvements, etc. Consequently, one of the most important characteristics from this experience, in our opinion, is the tenacity and persistence in achieving the goals set in spite of the difficulties encountered in the process and the frustration often generated by bureaucratic obstacles, the cultural differences and the different expectations of ones and others.

None of this would have been possible without the configuration and consolidation of a team of people who can share ideas and practices, to submit to critical ideas and practices and strengthen what unites us learn from what could be separated.

Like any other human endeavour, there are lights and shadows. Both groups have provided during these ten years of cooperation the opportunity to strengthen personal and institutional ties and open new avenues of collaboration in teaching and research in teacher education. Teacher education quality remains an enduring aim for us.
At this moment, closing our reflexion, we would also recall that the OEDC (1998:56), referring to these challenges and recommendations for the world of education, stresses the idea that if the actions are implemented at long term, well thought out, they respond to problems that will identify: “Improved planning, more involvement of teachers, better evaluation and dissemination will all strengthen the concept of professional development which must be seen to begin with pre-service and continue through a teacher’s career. Professional development is not simply an "add-on" or a "quick fix" to be applied when a particular problem arises.”

In conclusive terms, we make our own the words of Fullan (1993: 104, 131):
“(…) A high quality teaching force – always learning – is the sine qua non of coping with dynamic complexity, i.e., of helping to produce citizens who can manage their lives and relate to those around them in a continually changing world. There are no substitutes to having better teachers (...). We cannot have a learning society without a learning profession of teachers.”

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Mathematics teachers’ self-regulated learning competencies
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Abstract. The aim of this paper is to present a research made among 41 mathematics teachers regarding self-regulated learning of Mathematics. A questionnaire was designed and completed by these teachers, to find out their level of self-regulated learning competency and the methods they use while teaching Mathematics for increasing pupils’ self-regulation level. The research results show a correlation between the teachers’ self-regulated competency level and their involvement in developing students’ self-regulated learning skills. The results underline the necessity to develop pre-service and in-service teachers self-regulated learning, to change the Romanian mathematics curriculum in order to promote self-regulated learning and in the same time to rethink the national Mathematics tests for including challenging problems, not only verify the use of concepts and algorithms.

Keywords: self-regulated learning, mathematics education, teachers education

Introduction
Self-regulated learning (SRL) is an academically effective form of learning, through which the learner set goals and make plans before starting to learn; monitor and regulate his/her cognition, motivation and behavior during the learning process; and reflect on his/her learning process (Pintrich, 1995; Pintrich, 2000; Zimmerman, 2001). Self-regulation is important in problem solving, thus developing SRL skills and teaching of mathematics are in strong relation. Many countries have changed their mathematics curriculum and adapted a problem-solving approach. This approach gives the possibility to develop SRL skills, but in the same time it necessitates to increase the learners self-regulated level (Pape & Smith, 2002). The aim of this research is to evaluate mathematics teachers’ self-regulation during problem solving, competencies as self-efficacy and self-control, and study how teachers’ SRL skills correlate with their expectations on pupils’ problem-solving behavior. Recommendations for increasing teachers’ and pupils’ self-regulated level while learning mathematics are formulated in the conclusions.

1. Self-regulation in mathematics learning
Self-regulated learners are metacognitively, motivationally and behaviorally active participants in their own learning process (Zimmerman, 1986). SRL has three phases: forethought, performance control, and self-reflection phase.

During the **forethought phase** from cognitive point of view the learner analyses the task: activates his/her prior content and metacognitive knowledge, sets the goals of the learning process, and plans the strategy to be used. When solving a mathematical problem, the analysis of the task includes the understanding of the problem; identifying the given data, the relations between these data, and the requirements of the problem; recalling prior knowledge related with the problem (definitions; theorems, algorithms, strategies which could be used). Motivationally goal-orientation, self-efficacy, perception of task difficulty, and activation of the interest to perform the task are important in this phase. A study in the field of goal-orientation reported important relation between different goals and self-regulation (Tanner & Jones, 2003). Mastery goal-orientation is also positively related with the use of cognitive and self-regulated strategies (Pintrich, 1999). Self-efficacy has a key role in SRL. It refers to perceptions about one’s capabilities to organize and implement actions in order to reach the desired performance level (Bandura, 1997). Self-efficacy is student’s judgments about their
ability to successfully complete a task, as well as students’ confidence in his/her skills to perform the task (Pintrich et al., 1993). “People’s beliefs in their efficacy influence the choices they make, their aspirations, how much effort they mobilize in a given endeavor, how long they persevere in the face of difficulties and setbacks, whether their thought patterns are self-hindering or self-aiding, the amount of stress they experience in coping with taxing environmental demands, and their vulnerability to depression.” (Bandura, 1991, p. 257) Students’ interest in the content area of the task and their beliefs about the utility of the task are also important. In mathematics education students’ interest in mathematics, their beliefs in the utility of the mathematical knowledge in their future career or in their everyday life determine in a fundamental way their problem-solving behavior. „Belief systems are one’s mathematical world view, the perspective with which one approaches mathematics and mathematical task. One’s beliefs about mathematics can determine how one chooses to approach a problem, which techniques will be used or avoided, how long and how hard one will work on it, and so on.” (Schoenfeld, 1985, p. 45) The motivation for performing the task influences how students plan the time and effort allocation for solving the task.

The performance control phase includes self-control and self-monitoring of the cognitive strategies, motivation, and behavior. While solving mathematics problems “control has to do with the decisions and actions undertaken in analyzing and exploring problem conditions, planning courses of action, selecting and organizing strategies, monitoring actions and progress, checking outcomes and results, evaluating plans and strategies, revising and abandoning unproductive plans and strategies, and reflecting upon all decisions made and actions taken during the course of working on a problem.” (Lester et al., 1989, p. 4)

The self-reflection phase includes self-judgment and self-reaction. Self-judgment is one’s evaluation on his/her performance and recognition of the relationship between the achieved performance level and the quality of the learning process (Zimmerman, 2000). Thus self-regulated learners attribute their poor performance to lack of effort or time; or to the use of an inadequate strategy (Zimmerman, 1998). Students who attribute success to effort and failure to lack of effort may primary utilize strategies with which they have experienced the success (Borkowski, Weyhing & Turner). “The more students can take responsibility for their own learning, the more likely they are to attribute success to their own efforts. If students believe that their efforts will make a difference in what and how much they learn, then they are more likely to expend higher levels of effort in their studies.” (Hagen & Weinstein, 1995, p. 53) Self-reaction involves feelings about the achieved results: satisfaction or dissatisfaction (Zimmerman, 2002). When students feel satisfaction about their performance, they are more motivated to complete the task (Schunk, 2001). As mathematics is a difficult subject for many students, the feeling of satisfaction is important for motivating students for learning mathematics. As the mathematics skills of students from a classroom are different, to assure satisfaction each pupil should get tasks on their performance level.

2. Developing students’ self-regulated learning skills
In traditional mathematics education the teacher selects a task; introduce a method to solve the task; and gives exercises for practice in the illustrated skill (Schoenfeld, 1992). A good student in the traditional instruction is that one, who knows all the formulas and algorithms learned, solve many problems of the same type to memorize the required methods. This method of teaching mathematics doesn’t promote the development of mathematical thinking, problem solving, and self-regulation while learning mathematics. Students develop SRL skills when they are involved in challenging activities, when they have opportunities for making choices about their learning and collaborate with other students (Pintrich & Schunk, 2002). Lester t al. (1989) during a 12 week intervention in a seventh grade class used a chart with problem-solving tips to be used by the teacher and the students. Some of the tips contained in
this chart are related with SRL, for example “be sure to check your work along the way”
instruct to self-control. In this research no substantial differences were observed between
pupils’ activities before and after instruction. The authors have explained this result by the
short time of the intervention and the alternative used of problem-solving instruction with
regular mathematics teaching.
Perry (2002) observed five second grade and third grade classrooms, and she observed that in
classes, where teachers provide students opportunities to choose what to work on and to
modify talks to control challenge, pupils’ SRL skill level is higher.
Pape, Bell & Yetkin (2003) reported the results of a one year long intervention of developing
pupils’ SRL skills in a seventh grade class. During the classes students were encouraged to
make their strategies public, to name and describe their strategies, to use multiple
representations while solving the problems. After the intervention period students were more
able than previously to communicate mathematical understanding and justify their
mathematical reasoning. A small proportion of students recognized the relationship between
the strategies they used and the grades they earned.
Samuelsson (2008) has studied the impact of three different teaching method, traditional (with
mostly frontal activities at the blackboard), independent work, and problem-solving on
seventh grade pupils’ arithmetic and self-regulated learning skills. The results show that
students’ self-conception is affected more with traditional or problem-solving method. This is
because with these methods they get feedback from the teacher and from their colleagues. The
interest of the pupils towards mathematics was the best developed by the problem-solving
method.
Gandhi & Varma (2009) used the strategic content learning (SCL) approach to promote self-
regulated learning in mathematics of class eight. In SCL students get adequate support for
flexibility and recursively undertake the cognitive activities typical to SRL; and they are
engaged in interactive discussions about their learning processes. For example, whenever
students select a strategic approach, they are asked to describe in details the steps of the used
strategy. Thus students learn how to select, monitor, and adapt, or even create strategies for
solving a given task (Butler, 1995). Gandhi & Varma (2009) obtained notable results using
SCL: students gain in task performance, perception of task specific self-efficacy, and
metacognitive awareness about mathematical tasks and strategies.

3. Research

Design of the research
The aim of the research is to evaluate mathematics teachers’ self-regulated skills, and how
these correlate with their expectations on pupils’ problem-solving behavior.
The research was conducted during June-August 2010 in Romania.
A questionnaire was developed as the main tool for collecting the data. This questionnaire has
two parts. The aim of the first part is to evaluate teachers’ self-regulated learning skills, as
self-efficacy (e.g. they do know if they can solve a problem after reading the text of it) and
self-control (e.g. they do check if the solution is correct; they do check if they have used all
the important data; they do think about other methods of solving the problem, etc.). The
second part evaluates teachers’ guidance to pupils towards problem-solving. The
questionnaire contains affirmations which have to be evaluated by the teachers on a 5-point
scale: from 1- not at all typical for me to 5 – totally describes me. The affirmations were
formulated based on the theory of SRL and on the previous researches about teaching
methods which develop students’ SRL skills.
The questionnaire was anonymously filled in by the respondents. 41 mathematics teachers
have completed the questionnaire, 19% of them are male, 81% female. As regarding their age,
almost half of the respondents have between 31 and 40 years old, 20% between 41 and 50 years old, 15%-15% less than 20 years old respectively between 26 and 30 years old (Figure 1).

![Age distribution of the respondents](image1)

Figure 1. Age distribution of the respondents

37% of the respondents have 11-15 years of experience in teaching, 24% have between 16 and 25 years of experience, 20% have between 2 and 6 years of experience (Figure 2).

![Teaching experience of the respondents](image2)

Figure 2. Teaching experience of the respondents

More than half of the respondents are teaching in primary school (pupils’ age between 6/7 and 10/11), 22% in secondary school (pupils’ age between 10/11 and 14/15), 7% in high school pupils’ age between 14/15 and 18/19), and 17% both in secondary and high school (Figure 3).
Results
Means and standard deviation on teachers’ problem solving are shown in Table 1. We could observe that the lowest score is reached on searching other methods for solving the problem after the teacher got a way of obtaining the solution. The highest score is for checking, if all the important data were used during the problem-solving.

Table 1. Means and standard deviation on teachers’ problem-solving

<table>
<thead>
<tr>
<th>Affirmation</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowing, if he/she can solve the problem, after reading the text of it.</td>
<td>3.12</td>
<td>0.78</td>
</tr>
<tr>
<td>Reformulating the text of the problem with one’s own words.</td>
<td>3.07</td>
<td>0.95</td>
</tr>
<tr>
<td>Writing down the given data and the relations between these data.</td>
<td>3.95</td>
<td>0.69</td>
</tr>
<tr>
<td>Making drawings.</td>
<td>4.02</td>
<td>0.65</td>
</tr>
<tr>
<td>Self-questioning during the problem solving.</td>
<td>3.54</td>
<td>0.80</td>
</tr>
<tr>
<td>Checking, if all the data are used during the problem solving.</td>
<td>4.12</td>
<td>0.54</td>
</tr>
<tr>
<td>After solving the problem, thinking about other solutions.</td>
<td>2.85</td>
<td>0.87</td>
</tr>
<tr>
<td>Checking, if the solution is correct.</td>
<td>4.10</td>
<td>0.77</td>
</tr>
<tr>
<td>If one can’t solve a problem, searches for similar solved problems.</td>
<td>3.70</td>
<td>0.97</td>
</tr>
<tr>
<td>If one can’t solve a problem, asks for the help of a colleague.</td>
<td>2.93</td>
<td>0.95</td>
</tr>
</tbody>
</table>

Means and standard deviation on teachers’ expectations on pupils’ problem-solving are shown in Table 2. The problem-solving behavior which teachers most expect from their students are reading carefully the text of the problem, writing down the given data and the relation between these data, and checking, if the solution is correct. The less expected behavior is to think about other ways of solving the problem, after they have got a solution.

Table 2. Means and standard deviation on teachers’ expectation on pupils’ problem-solving

<table>
<thead>
<tr>
<th>Affirmation</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading carefully the text of the problem.</td>
<td>4.51</td>
<td>0.65</td>
</tr>
<tr>
<td>Reformulating the text of the problem with one’s own words.</td>
<td>3.53</td>
<td>0.85</td>
</tr>
<tr>
<td>Writing down the given data and the relations between these data.</td>
<td>4.34</td>
<td>0.72</td>
</tr>
</tbody>
</table>
Checking, if all the data are used during the problem solving. 4.05 0.72
After solving the problem, thinking about other solutions. 3.14 0.83
Checking, if the solution is correct. 4.32 0.65
Writing down the detailed solution. 3.80 0.79
Explaining the solution to their colleagues. 3.38 0.57

Teachers try to choose interesting problems (mean 3.83, standard deviation 0.73) or problems from the everyday life (mean 3.85, standard deviation 0.98) for the classroom. The score for taking in account the problems given on different national tests is lower (mean 3.17, standard deviation 0.89). Also taking in account pupils’ mathematics skills when assigning tasks is important for teachers (mean 3.41, standard deviation 0.85).

Studying the correlation between teachers’ problem-solving behavior and their expectation on pupils’ problem-solving behavior, we observe that there is a positive correlation, but it is not a strong one (Table 3).

Table 3. Correlation between teachers’ problem-solving behavior and their expectation on pupils’ problem-solving behavior

<table>
<thead>
<tr>
<th>Affirmation</th>
<th>Correlation between teachers’ problem-solving behavior and their expectations on the pupils problem-solving behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reformulating the text of the problem with one’s own words.</td>
<td>0.52</td>
</tr>
<tr>
<td>Writing down the given data and the relations between these data.</td>
<td>0.58</td>
</tr>
<tr>
<td>Checking, if all the data are used during the problem solving.</td>
<td>0.50</td>
</tr>
<tr>
<td>After solving the problem, thinking about other solutions.</td>
<td>0.55</td>
</tr>
<tr>
<td>Checking, if the solution is correct.</td>
<td>0.31</td>
</tr>
</tbody>
</table>

Discussion

When faced with an academic problem, self-regulated learners begin to analyze the task, identify the requirements of it (Pintrich, 2000; Schunk, 2000). Teachers obtained high score on the items related with analyzing the problem: writing down the data and the relations between these; making drawings.

Also teachers’ self-monitoring competency is above average. This competency is tested with the following items: self-questioning during problem solving and checking if all the data are used during the problem solving.

The lowest score obtained by the teachers is on searching more methods for solving the problem. This means that most of the teachers don’t make an evaluation of their strategy used for solving the problem. Help-seeking is also an important skill of a self-regulated learner. If a person is stacked with a problem (i.e. recalled all the previous knowledge, tried all the know methods, tried to create a new method for solving the problem), usually has two possibilities: to find a similar solved problem or to seek for the help of a colleague. It is interested, that teachers obtained a score around average on asking for the help of a colleague.

Explaining how they solve a problem is important to develop students’ SRL skills. Questions as “What (exactly) are you doing? Why are you doing it? How does it help you?” (Schoenfeld, 1987, p. 206) help students to reflect on their strategies and to articulate their reasoning. “When thinking is articulated regularly, patterns of thinking develop that are iterative. Thinking cannot be articulated unless students reflect on the problem and the strategies they use to solve it; articulation, in turn, increase reflection, which leads to understanding.” (Fennema et al., 1999, p. 188) Respondents score on asking the pupils to explain the solution to their colleagues is just a bit above average. A higher score was
obtained for asking students to write down the detailed solution. This also helps them to verbalize their thinking. The collaborating learning helps developing students’ self-regulation competencies (Pintrich & Schunk, 2002). During collaborated learning students need to explain their reasoning and they get feedback from their colleagues. Through critically examining others thinking and reasoning, participating in discussions, students learn to monitor their own thinking and to build adequate reasoning (Artzt & Yaloz-Femia, 1999).

Giving students interesting problems to solve increase their motivation for learning mathematics. Teachers try to choose interesting problems or problems from the everyday life for the classroom activities, and taking less in account the problems given at national tests. Usually the problems from the Romanian national tests are mathematically formulated; don’t have any relation with pupils’ real life (Marchis, 2009a). None of the problems from the national tests in Romania are challenging. (Marchis, 2009b) Most of the problems given on national Mathematics tests in Romania cover only the knowledge, understanding and application cognitive levels, to solve them it is required to apply formulas or algorithms. These have more consequences: pupils don’t like Mathematics, as they don’t see why they need to learn it; in their everyday life they meet problems, where Mathematics is present, and they don’t know how to solve them, as they don’t know how to transfer Mathematics to practical problems. Thus giving only this kind of problems to pupils will loose their interest in mathematics learning.

Studying the correlation between teachers’ problem-solving behavior and their expectation on pupils’ problem-solving behavior, we observe, that there is a positive mild correlation. It is interested, that while teachers are not trying to solve the problem using more methods, they expect this from their pupils.

4. Conclusions

Teachers’ self-regulated learning skills are around medium level. This shows the need of developing pre-service and in-service mathematics teachers’ self-regulation. Teachers’ self-regulating competencies are in positive correlation with their methods of developing pupils’ self-regulated learning skills. Thus developing teachers’ SRL skills will lead to the improvement of pupils’ self-regulation, which will imply the improvement of students’ mathematics results. Also teachers have to be trained to be able to use teaching methods which facilitate the development of pupils’ self-regulated learning competencies.

The Romanian mathematics curriculum is not adequate for developing students’ SRL skills. It put the accent on knowing concepts and mathematical relations, constructing and applying algorithms for processing data. Mathematical communication and development of pupils’ motivation for learning mathematics are present in the curriculum, but doesn’t have an important role. It stops at the analysis level of the cognitive domain taxonomy of Bloom, without covering the synthesis. (Ciascai & Marchis, 2009) The mathematics curriculum should be rewritten in order to facilitate the development of SRL skills.

The national tests in Mathematics should be rethought. Part of the problems given on these tests should be challenging ones, where pupils have to create the solution and not to use learned algorithms. In this way teachers would put more accents on developing pupils’ problem solving and self-regulated competencies instead of practicing routine problems.

It would be interested to study the correlation between teachers SRL skills and their pupils’ self-regulation level.

References


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Beyond compliance: university – school network learning partnerships.

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Abstract: This paper argues that the interaction between good teachers and learners in classrooms has the biggest effect on learner outcomes. Teachers learn in authentic contexts and their formative reflection on practice can be enhanced through collaborative networks between teachers and university education departments.

Managerialism and ‘new professionalism’
In England a technical rationalist philosophy has dominated education policy, for nearly twenty years. Powerful mechanisms such as centralised curriculum and an ubiquitous inspection regime, linked to funding were put in place to ensure that teachers and teacher educators conform to the centrally prescribed policy agendas and strategies introduced by successive governments (Furlong, 2009). Although forms of so called ‘new professionalism’ are prevalent in other worldwide education systems there is now a growing acknowledgment that such an approach is not producing the predicted dramatic increases in student examination performance. Indeed Singapore, which has been identified as one of the world’s top performing school systems, has shifted education policy to a more open form of teacher professionalism which supports the development of ‘thinking schools’. The Singapore government believe that it will be through focussing on teacher education and through promoting inquiry and innovation in mainstream education that students will be equipped with the necessary knowledge and skills to maintain Singapore’s position in the global economy (Hogan & Gopinathan, 2008; Barber & Moushad, 2007).

Teachers in school departments
Nonetheless, in the UK, ‘technical rationality’ has radically changed the culture of schools and university education department over the last 20 years. Gu & Day (2007) documented the lives of 300 teachers across 100 schools in England and analysed the challenges that teachers faced in the UK in the early 2000s. Day’s (2007) ‘Vitae’ study demonstrated that although teachers’ professional autonomy was severely reduced, most teachers adapted to this new environment because of their
strong personal commitment to their students, despite many disagreeing with the broad thrust of the education policy they were required to implement.

Hence ‘new managerialism’ has effectively shifted the prevalent discourse from teacher education to teacher training and professional development. The new language assumes a deficit in teachers’ knowledge regardless of their level of expertise or experience and that these deficiencies can be rectified through professional development.

Day’s study (2007) established that teachers’ learning varies with years of experience. He identified six professional phases of a teachers’ career where teachers have different levels of expertise and limitations in their knowledge, see Table One.

<table>
<thead>
<tr>
<th>Professional Phase</th>
<th>Number of years</th>
<th>Challenges</th>
<th>Personal Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early Career</td>
<td>0 – 3</td>
<td>Long term Commitment</td>
<td>Support and challenge</td>
</tr>
<tr>
<td></td>
<td>4 -7</td>
<td>Positive Identity</td>
<td>Developing self efficacy</td>
</tr>
<tr>
<td>Experienced</td>
<td>8 -15</td>
<td>Changing role</td>
<td>Sustaining engagement and motivation</td>
</tr>
<tr>
<td></td>
<td>16+</td>
<td>Work life balance</td>
<td>Career advancement and job satisfaction</td>
</tr>
</tbody>
</table>

*Table One: Professional life phases (Based on Day et al. 2007)*

Furthermore Day (2007) pointed out that schools tend to disregard the ideas and recent knowledge that new teachers bring to them. In the UK all new teachers are well educated graduates who come to the profession with enthusiasm, drive, passion for the profession, and in many cases considerable experience from previous careers. At the start of their career new teachers also want to carry on being self directed in their learning.

**Teacher education in university departments**

University departments of education have also faced extreme challenges as a result of technical rationalist policy, where the main thrust has been to establish ‘what works’ in initial teacher education. ‘New professionalism’ has now become a very powerful form of control, where complying with centralised curricula and meeting inspection requirements is linked directly to allocation of students
numbers and hence to essential funding. This funding has been stretched further by the establishment of non-university based alternate routes into teaching, largely based in schools. Furthermore the publication of inspection reports has resulted in a competitive climate between individual university departments and school centred courses. The overall effect has been to undermine effective regional planning and inhibit mutual learning and innovation.

Another significant result of technical rational policy has been the growing marginalisation of higher education in initial teacher education, and in in-service education in particular. Centralised curricula have meant that the language of teacher education has come to be dominated by ‘standards, competences, effective and best’ practice which has served to narrow still further the forms of professional knowledge available to the teaching profession (Furlong, 2009).

In May 2010 a new government was elected in the UK. However hopes of a radical change in direction were dashed when, in his opening speech, the new minister for education quoted directly from Barber & Moushad’s (2007) McKinsey technical rational informed report. The report states baldly that a centralized curriculum of ‘what works’ must be the way forward. Indeed in an earlier lecture Barber had clarified precisely what this meant when he said:

‘Many still cling to the demonstrably false view that creativity consists of each teacher making it up in their own classroom. This is not creativity, it is betrayal’ and ‘that once the educational experts have worked out what ‘excellent instruction’ is then it is a simple task of government to ‘roll out’ that policy for all teachers’ (Barber, 2009, p19).

Such an approach effectively removes teachers and teacher educators from the debate about the nature or value of proposed forms of ‘excellent instruction’ (Furlong, 2000).

Furthermore in Universities ambivalence towards professional teacher educators has had other consequences too. In England and Wales, in the early 90’s there was a move towards recruiting expert teachers with considerable school-based practice into teaching on university led courses. These teachers were careers changers having spent time in schools before moving to academia. In recent years there has been a university sector led move to marginalize these professionally oriented teacher educators because their research output is often less than more academic oriented colleagues. This has arisen because of increased pressures linking essential funding to academic research output. Yet it is precisely these staff who are central to professional teacher education; it is
they who have recent classroom based professional classroom experience and who are also able to provide the bridge between practice and other forms of codified academic knowledge.

The centralisation of academic knowledge creation and ‘one size fits all’ approach to teacher education programmes along with the marginalisation of teacher education within university departments has whittled away at the professional identity of teachers and teacher educators. This identity which was centred on an ‘inner dedication’ has been diminished by the rising tide of marketisation, external regulation, the prevailing audit culture resulting in a devaluing of professional practice (Furlong, 2000).

**Why teacher education matters**

Successive UK governments have stressed the importance of educational achievement, and their measure of success has been through using students’ examination performance in high stake tests and comparison of such performance in international tables. Schools have responded to this and have shifted the emphasis onto preparing students for and recording results and data from high stakes examinations. Not surprisingly the focus for professional development has also been on whole school policy initiatives designed to increase students performance in tests. Indeed one essential requirement of gaining a teaching qualification at the time of writing is, to be able to demonstrate the ability to read and interpret school performance data.

Recent research by Wiliam (2010) has called into question the prescribed centralized approach to education policy. His meta-analysis challenges the UK policy thrust of trying to define and then emulate the features of the most successful schools. He argues that as richer, more reliable data is collected, the evidence available suggests that one of the biggest differences between so called “good” schools and “bad” schools is the local demographics and consequently the difference in the students attending the schools. Wiliam has also identified that 7% of the variation between schools on the standard benchmark of performance is due to the effect of the school. The other 93% is due to factors over which the school has no control (Wiliam, 2010). Indeed in the average school, 15 out of a class of 30 will achieve five good grades at GCSE (including English and mathematics). Furthermore if the same students were in a so-called “good” school, then 17 out of 30 would reach the same standard, and in a so-called “bad” school, then only 13 out of 30 would do so.

Wiliam goes further and asserts that it does not matter which school a student attends, but it matters very much in which classrooms in that school the student is placed. Moreover, in the classrooms of
the most effective teachers, students from disadvantaged backgrounds learn just as much as those from advantaged backgrounds and those with behavioural difficulties learn as much as those without. Wiliam concludes baldly that the only thing that really matters is the ‘quality of the teacher’ (Wiliam, 2009). Indeed Barber & Mousha (2007) also come to same conclusion in their report. Whilst this is not a new idea, it is has been lost in the plethora of whole school, top down initiatives which have dominated recent UK policy. Nevertheless the conclusion does highlight the importance of good education at all stages of a teacher's career.

**Teacher knowledge and learning**

An implicit assumption made by the proponents of ‘one size fits all effective practice’ is that knowledge can be transmitted effortlessly from one to practitioner to another by following instructions or by simply mimicking the behavior of other teachers in any classroom situation. A further flaw in this argument is that this can somehow be mandated and guaranteed through attendance at professional development programmes (Webster Wright, 2009). Such assumptions are not only flawed but they also limit a professional teachers’ ability to engage in context specific critical inquiry and have the net effect of maintaining the status quo.

Professional learning and teacher knowledge is embodied, contextual and embedded in practice. Changes in learning occur through practice experience and reflective action within contexts that may pose dilemmas, that continued professional learning is situated, social and constructed. Teacher knowledge is both explicit and tacit in form. Explicit, codified academic knowledge is the accumulated propositional knowledge stored in texts, databases, studentship, scholarship, research and cultural practices of teaching (Eraut, 2002). This type of knowledge is related to intellectual development and progresses through a hierarchy leading to greater levels of abstraction and a deeper understanding. Tacit teacher knowledge on the other hand is context specific and difficult to make explicit or to represent in a textual form because it is largely acquired informally through participation in complex classrooms. Such tacit knowledge is often so ‘taken for granted’ that teachers are unaware of its influence on their behaviour (Eraut, 2004).

Teachers learn through both reflection and action, by working with others (Schôn, 1983) through asking questions, sharing information, seeking help, experimenting with innovative actions and seeking feedback (Eraut, 2002). At the beginning of their education courses when novices observe an expert teacher at work, teaching can look deceptively simple. However when the new teacher starts to teach, it very soon becomes apparent that there are many things going on in the classroom that are
‘hidden’. This is because expert teachers are required to make nuanced judgements in the face of considerable complexity in what are essentially unique classrooms; in other words judgements are made based on developing context specific, tacit knowledge in action. Tacit and explicit knowledge are acquired, renewed and modified in different ways. It stands to reason then that context specific tacit knowledge can only be acquired through collaborating with more expert teachers and interacting with students in authentic classrooms (Lave & Wenger, 1991; Kelly, 2006). However to simply mimic the behaviour of an expert teacher will be an impoverished education which will not be easily transferable to another context.

Consequently, a fully embedded school based apprenticeship model of teacher learning is insufficient to prepare new teachers, for two reasons. First, it is often the case that expert teachers’ actions tend to become automated, drawing on intuitive tacit knowledge to the point that it is almost procedural in character (Knight, 2002). Expert teachers’ knowledge may have become so embedded that it is difficult for the expert to rationalize and articulate what is actually going on in a classroom and why. Furthermore, new teachers’ judgements are influenced by their own experience as a student in similar classrooms, although this previous experience will have been gleaned from the perspective of being one student in a classroom full of individual students, in probably a very different school context. Making sense of classrooms from a teacher’s perspective is more sophisticated, involving deliberative decision making. This deliberative approach is based on a deeper understanding of the contextual features of the specific classroom together with detailed knowledge of the student and what motivates them to learn. Such an approach is not only driven by rational thinking but to a large degree by human experiences and emotions (Hoekstra et al., 2007). In other words, becoming a teacher is about ‘growing capacity to make appropriate judgements in changing, and often unique circumstances’ (Beckett & Hager, 2000, p. 302). Table Two summarises different terms used in the literature to describe approaches taken by novice and expert teachers.
<table>
<thead>
<tr>
<th>Implicit / Tacit Judgements</th>
<th>Reactive / Reflective Judgements</th>
<th>Deliberative Judgements</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘Hot’ action</td>
<td>Judgements linked to actions and the classroom environment</td>
<td>‘Cooler’ action</td>
</tr>
<tr>
<td>Judgements based on intuition</td>
<td>Judgements based on deep understanding of the dynamics of the teacher/students relationships and the contextual features</td>
<td></td>
</tr>
<tr>
<td>Mainly emotional responses</td>
<td>Respond to affective and social contexts</td>
<td>Cognitive domains also involved (Teakett &amp; Hager)</td>
</tr>
<tr>
<td>Knowledge in action</td>
<td>Knowledge of action</td>
<td>Knowledge for action</td>
</tr>
<tr>
<td>‘Act’ like a teacher</td>
<td>‘Think’ like a teacher</td>
<td>(Furlong &amp; Maynard)</td>
</tr>
<tr>
<td>Recognises patterns</td>
<td>Rapid interpretation</td>
<td>Review involving discussion/ analysis</td>
</tr>
<tr>
<td>Instant response</td>
<td>Intuitive response</td>
<td>Deliberative decision making</td>
</tr>
<tr>
<td>Routine action</td>
<td>Routines punctuated by rapid decisions implicit monitoring</td>
<td>Planned action with progress reviews</td>
</tr>
<tr>
<td>Some awareness of the situation</td>
<td>Short reactive reflection</td>
<td>Conscious monitoring of thought and activity, Self management, Evaluation.</td>
</tr>
</tbody>
</table>

**Table Two: Teacher Judgements**

A study of novice teachers taking part in a university based course of initial teacher education analysed student teachers’ accounts of their learning and showed that becoming a teacher is a complex, multidimensional, idiosyncratic and context-specific process. Indeed, not only is the school based experience a different experience for each novice teacher (dependent on the specific schools in which they are placed), but each new teacher also brings to that particular context various deep-rooted preconceptions about the nature of effective teaching and learning, and their own set of expectations about how to develop the professional knowledge that they will need (Burn et al, 2003). Hobson et al.’s (2006) longitudinal study of novice teachers moving into their early careers came to the same conclusion that ‘one size of initial teacher preparation does not fit all’.

Novice teachers start by learning how to perform in the classroom, to ‘act’ like a teacher and, with expert guidance and reflection, subsequently learn to ‘think’ like a teacher (Furlong, & Maynard, 1995). ‘Thinking’ like a teacher requires taking account of where the learner is at, having regard for the nature of that which has to be learnt and subsequently planning appropriate sequences of lessons which bring about student learning. All three steps require explicit knowledge of how students learn, what motivates them, how students interact in groups in social situations and how this can be applied to specific classrooms at a particular time and place (Eraut, 2004). Therefore, learning for a novice is about deepening inward knowledge and enriching existing meaning structures. This might be recursive, circling back to concepts and internalizing them into behaviours and beliefs (Fenwick, 2001).
For the expert teacher to make personal, tacit knowledge explicit will require standing back from the ‘hot action’ of everyday classroom pressure and adopting a ‘deliberative rational’ approach in appraising what they do. This is an important step in articulating and illustrating how, as an expert teacher, they actually engage in ‘calculative rationality’ to make decisions in new situations (Dreyfus & Dreyfus, 1986). This is not a straightforward process and is also above and beyond what they do in their day to day teaching. Therefore an expert teacher may need support in deconstructing their practice so that it is helpful for novices. This is one key role for the university based teacher educator. Expert teachers also need to continue to learn throughout their career so that their teacher knowledge can be updated in response to changes in curriculum and the world of work. It is no longer acceptable to assume that teacher learning ends when students graduate from Initial Teacher Education programmes or completes in-school induction.

In a rapidly changing world teachers at all stages have to keep abreast of curriculum changes and developments in subject areas. Teaching is such a complex process that one lifetime is not enough to master it, but by rigorously focusing on practice, teachers can continue to improve throughout their career.

Teacher learning is based on sustained intellectual challenge and stimulation and opportunities to talk about work. Teachers do not just want quick fixes, they are all graduates, highly qualified people who are not only capable of, but want to engage in, intellectual discussion and debate about serious issues. School leaders then have a duty to create a culture for the continuous improvement of practice, and to keep the focus on a small number of things that are likely to improve outcomes for students. In addition, they need to create the time within the existing teachers’ contracts to do this, and to encourage the taking of sensible risks.

**Teachers collaborating in networks**

The expertise needed to raise student achievement already exists in many, if not most, schools. In the highest performing schools there is a culture that encourages teachers and administrators to work together on a regular basis, to consult each other more often on matters of teaching and learning, to share responsibilities for instructional improvement, and to implement professional-learning opportunities that address both their needs and their students’.

It is not enough to bring new talent into the classroom or reward high performers. Innovation that leads to continuing cycles of improvement will begin on a large scale only when teachers learn together and
work collaboratively, using readily available data and pooling their collective expertise to address problems.

In a recent UK wide study of the state of CPD nationwide, Pedder et al (2009) recorded six features which increased teachers’ professional learning and as a result also enhanced students’ learning. Three characteristics are related to the structure of the professional learning activity and three are related to the nature of the professional learning activity. The structural characteristics include how the activity is organised. For an activity to transform practice it must focus on school specific classroom based practice. Moreover learning is assisted when teachers work collaboratively in study groups, teacher networks through mentoring, and teacher research. Finally professional learning is more likely to take place through sustained activity over a long period of time.

The core features of successful professional learning activities include opportunities for active learning which promote coherence in teachers’ professional learning particularly when this is situated within a practice based context (Pedder et al, 2009).

Evidence from a further study focussing on UK secondary school science departments carried out by a team from several university education departments working with the network of science learning centres, showed that science teachers professional learning was often dominated by whole school policy initiatives and that increasingly schools were running their own in-house professional learning activities (National Network for Science Learning Centres, 2010).

**Beyond Compliance**

The central argument of the paper is that teacher educators in university departments have a unique contribution to make to all forms of professional education and development of teachers. I want to argue that transformative learning can come about through collaboration between university departments and school partners in a learning community. The next sections explain the rationale for the university–school network, how learning can take place within such a network and why this has the potential to alter ways of being professional (Billet & Somerville, 2004), and that small scale interventions led by teacher communities and supported by university departments can also be highly successful (Hickey & Mohan, 2004).
A partnership model of teacher education

Learning to become a teacher, in the fullest professional sense, is not just about having practical knowledge gained through learning the ‘craft’ in a classroom or through studying about how to teach from texts but is also about gaining and accessing both explicit and tacit knowledge in an authentic classroom. School–university partnership courses enable the guided acquisition and integration of both explicit and tacit knowledge through professional conversations. The complementary roles of expert teacher and teacher educators facilitate knowledge conversion through social, cultural and collective processes within a school university partnership ITE course. This can be conceptualised using a four stage model devised by Nonaka & Takeuchi (1995) and developed by Nonaka & Konno (1998), see Figure one.

Socialisation process: establishing a trusting relationship

The socialisation process is about building a trusting relationship between members of the network. Teacher educators and school based experts work together closely, value the contribution each member brings to professional learning through working in a long established collegial culture of reflection and open honest feedback. New teachers are introduced to the network through careful induction into the cultures of both school and university social contexts through being and learning in each context. By being immersed in the context novices pick up ideas about the rules and rituals of the functioning classroom and university course. However the outward actions observed and lived experiences are also rooted in ideas, values and emotions which are not immediately apparent. Furthermore new teachers bring their own deep seated beliefs about school and how learning takes place. It is through dialogue between experts, new teachers and educators that these ‘hidden’ ideas and values are externalized and made explicit.
Figure One: Knowledge creation and sharing within a school – university ITE course

**Externalization: transformative power of the network**

The externalization process of becoming a new teacher or in the case of more experienced teachers of transforming existing practice is facilitated through reflecting more deeply on what is going on in a classroom. Developing understanding occurs by going further, by being reflexive. Being reflexive involves examining underlying assumptions and priorities that shape interaction within a given time, place and situation. In other words, a reflexive teacher can ‘stand back’ and examine the underlying beliefs and values which are informing decision-making and actions in their own classroom situations. ‘Standing back’ provides the space to think, and when professional conversations take place between novice and expert about practice this can be transformative. In our network the university based educator contributes through also asking challenging questions of both expert and novice and by bringing recent research and conceptual tools to the conversations. School based partners may challenge or incorporate new ideas into their practice when they value and can see how to incorporate the ideas the university partners bring. This is more likely to happen when there is a trusting relationship established between school and university partners. Within our network many of the experts have been educated at the university and completed their initial teacher education there. Many expert teachers have worked within the network for many years and share similar values and approaches
Consequently, externalization within the network is a case of both school and university based experts articulating their understanding. Together the expert teacher and teacher educators help novices to make better judgements in their classroom interactions. In other words engaging in professional dialogue helps to make complex classroom dynamics more accessible to a novice. For more experienced teachers engaging in classroom based research can also be transformative (Zeichner, 2003). The experience of engaging in self study research helps teachers to become more confident about their ability to be more proactive in dealing with difficult situations that arise in their own teaching and to acquire habits and skills of inquiry that are used beyond the research experience to analyse the complexities of teaching.

Furthermore in the case of more experienced teachers, engaging in classroom based research seems to develop or rekindle an excitement and enthusiasm about teaching and provides a validation of the importance of the work that teachers do. Unfortunately for some long serving teachers this can be missing from their working day (Ziechner, 2003).

**Combination and Internalization: sustaining the network**

During the process of combination of new understanding from research findings the novice and experienced teachers come to re-appraise their understanding of complex classroom dynamics in-situ. In initial teacher education this is done by a novice working with an expert to capture and integrate new knowledge, through collecting evidence based on focussed classroom based tasks, and engaging in an individual small scale action research project. For more experienced teachers this takes place through working with an expert in the university who takes on the role of research knowledge provider and critical friend by providing conceptual tools with which to re-examine school based issues. Through this process new teachers internalize newly developed ideas and knowledge with the overall effect being that they are better equipped to make more appropriate judgements in classrooms and decisions.

Figure two represents the now established school- university network. There are a number of activities which bring people within the network together; these can be thought of as knots in the net, and are represented by the oval and rectangle shapes in figure two. The threads between the knots link people through good communication channels and trusting relationships within the network. The links are made through reciprocal face to face meetings in both the school and university and through using new technology tools (Wohlstetter, 2003).
Figure Two: University – school network knots and threads
The network is sustained through building on the trusting relationship established between new teachers; teacher educators in the university and school based expert teachers who have also been involved in planning the initial teacher education programme. This initial teacher education programme is a Masters (M) Level course which involves a period of extended classroom focussed research.

On completion of the course many of the new teachers take up posts in partner schools and also carry on to complete the second year of a university accredited masters courses in the early stages of their career. There is also the opportunity for more experienced teachers to accredit their school focussed research by completing university provided professional and masters courses.

Over the last three years we have generated new knowledge about the classrooms within our partner schools and this has been shared within the network through online repositories and face to face meetings. There is considerable evidence linking this school–university initiated classroom based research to changes in students’ attitudes and behaviour although this is embedded within the findings of the individual teachers’ dissertations and theses. The meta-analysis of this work is still in progress although the individual findings are disseminated within the network through a peer reviewed journal and wiki page.

**Future challenges**

Within the collaborative network professional teacher educators make a distinctive contribution. Not only do they bring a history of being highly successful classroom practitioners they also add specialist pedagogical content knowledge as well as recent research knowledge. Importantly, teacher educators have also built up a long term trusted relationship with expert teachers and their schools through on-going contact with new teachers on initial teacher education programmes, then subsequently introducing them to more sustained classroom based research as part of accredited higher degree courses and finally though collaborative university initiated research projects. The trusting relationship is founded on mutual respect for the differing roles each have within the network.

The core activity of an expert teacher is to educate the students in their school. As I have discussed in an earlier section becoming a teacher is a complex, nuanced process of learning to make appropriate judgements in unique settings. The transition from being a new graduate or career changer to expert teacher involves working closely with expert teachers, as opposed to experienced teachers, in authentic classrooms. I would argue that being an expert teacher requires a deep understanding of how children learn, why they behave in the way they do as well as how best to introduce specialist subject knowledge.
One big challenge still to be overcome is in persuading university based educational researchers that expert teaching is an intellectually challenging, complex process that is different but no less demanding than producing scholarly educational research. (Figure three represents this dichotomy using McIntyre's (2005) continuum of research).

Conversely the major challenge for teachers is firstly, convincing new teachers that to become an expert teacher requires more than long service. Secondly that being an expert means: being aware of current educational developments, being able to undertake school based research and being able to carry this out rigorously using the same methods as university based educational researchers. The key role of professional teacher educators is to work closely with teachers both in schools and beyond and to recognize and value teachers' direct practical knowledge while at the same time themselves engaging in professionally oriented research and scholarship. It is only by developing a deep understanding of current practice and then working closely with teachers, supporting them as they collectively engage in their own critical, rational reflection, that teacher educators can help teachers and schools develop their specific experience into practical, rationally based theories and visa versa.

![Figure Three: Teacher—research knowledge continuum](image-url)
However, if university departments are to play a full part in a collaborative approach to teacher learning, then it will mean those in universities and schools working in new and creative ways with a variety of different partners and across a broad range of activities form initial teacher education through supporting induction, continued professional learning and teacher led research.

**Conclusion**

Creating a culture of inquiry that respects the voices of teachers and the knowledge they bring to the research experience is a key dimension of our school–university network. Such longer term investment in building capacity of teachers to exercise their judgement and leadership abilities to improve learning for themselves and their students can only be a positive approach. Unfortunately policy makers work with shorter time scales and are required to demonstrate easily measurable immediate effects. Our network operates on the principles of long, sustained slow bottom up growth.

In the end the quality of learning for students in our schools will depend to no small extent on the quality of learning and opportunity for teacher growth. Whilst it is appropriate and necessary for policy makers and school leaders to set directions for reforms and to provide teachers with skills and content that they need to carry them out there must also be scope for sustained intellectual challenge for new teacher graduate professionals.

**References**


Quality assurance in teacher training in Flanders

By Floris Lammens (VLHORA) and Pieter-Jan Van de Velde (VLIR)

Abstract
In Flanders two types of teacher training exist. 180 ECTS bachelor’s programmes with a professional focus preparing for pre-school, primary or lower secondary school teaching and 60 ECTS post-graduate teacher training programmes for people with professional skills or an academic degree wanting to teach in secondary schools. This paper tackles the QA system for the latter type of teacher training. This type takes place at universities, university colleges and centres for adult education. The Flemish Decree on Teacher Training (2006) created a unified legal framework for them and set up expertise networks which should foster cooperation between the three types of institutions, including sharing experiences and good practices in internal QA.

The Decree assigned the coordination of the external QA, to the QA units of VLIR (Flemish Interuniversity Council) and VLHORA (Flemish Council of University Colleges), both full member of ENQA and registered with EQAR. VLIR and VLHORA have assembled a working group containing representatives from the three types of institutions which has created an assessment framework that is “fit for purpose”, starting from the existing VLIR and VLHORA framework for higher education. The assessment framework envisages to grasp every aspect of a programme, focussing not only on teaching staff and results, but also on goals, content, facilities and internal quality assurance. The framework defined a modus operandi for an assessment panel of peers whose task consists in assessing the quality according to the criteria and in making recommendations for improvement, resulting in a public report. The assessment framework and procedures were approved by all parties in October 2009 and in 2011 and 2012 all post-graduate teacher training programmes at all 40 institutions involved will be assessed. It is the first time that an assessment like this is organised and the first time for VLIR and VLHORA to organise a clustered assessment of programmes organised by three different types of educational institutions.

In this paper we want to describe the quality assurance framework we have developed, as well as share the first experiences of the cooperation between the two agencies and the three types of institutions.

Introduction
Education is a competence of the Flemish community. In this paper we will only focus on the situation in the Dutch speaking Community (Flanders). In Flanders two types of teacher training exist. On the one hand 180 ECTS bachelor’s programmes with a professional focus prepare students for a career in pre-school (age 3-6), primary (age 6-12) or lower secondary school (age 12-15) teaching. Those programmes are subject to the standard external quality assurance system in Flanders, based on external programme assessment and subsequent accreditation. On the other hand 60 ECTS post-graduate teacher training programmes are offered to people who have professional skills or an academic degree, and who want to teach their field of expertise in a secondary school. For higher education no teacher training diploma is necessary. This paper tackles the QA system which has been specifically developed for the latter type of teacher training, called ‘Specifieke Lerarenopleiding’ or ‘SLO’.

Historical background
Since 1929 universities used to organise a minimal academic teacher training for graduates who wanted to teach in secondary schools. Later, also university colleges (‘hogescholen’) got the opportunity to offer teacher training programmes for their graduates. Since 1996 academic teacher training counted 34 ECTS credits. Most of those credits were dedicated to theoretical training, with a focus on pedagogy and subject specific pedagogy. The pre-service training was limited and in general seen as too little. Students most often took this teacher training during their master’s degree or while already teaching.

Also centres for adult education have been offering teacher training programmes since long. They have a broader target group than universities and university colleges. Originally centres for adult education focused mainly on people who want to acquire the proficiency in pedagogy and didactics required to teach in technical and vocational secondary schools. However, centres for adult education broadened their scope and also
attracted university and university college graduates. Centres for adult education offered a more practice oriented programme than universities and university colleges. They organised their programmes mostly exclusively in the evenings and weekends.

The 2006 Decree

In 2006 a new Decree on Teacher Training was adopted. This decree created a unified legal framework for teacher training programmes at universities, university colleges and centres for adult education. This decree was the result of long years of discussion on how to organise teacher training. All post-graduate teacher training programmes are now offering the same 'Teacher' diploma. The programmes were extended to 60 ECTS (1500 to 1800 hours of study load), of which 30 credits should focus on the theoretical basis of pedagogy and 30 credits focus on practical training. The credits for practical training relate to practical exercises at university, observation and student guidance, as well as to in-class teaching. The practical training can be offered in pre-service training or in in-service training. For pre-service training about 60 hours of in class practice are required from the student, together with other assignments. For in-service training 500 hours of (paid) teaching experience are required to fulfill the practical training in order to obtain the teacher training degree. The work invested in other assignments should be more limited than in the pre-service training.

Due to the increased work load for students who take their teacher training at universities and university colleges, the number of students taking a teacher training degree at these institutions fell down dramatically after the reform. E.g. comparing academic years 2004-2005 and 2008-2009, student numbers in post-graduate teacher training programmes at universities went down from 4582 to 2087 and at university colleges from 950 to 487. Within centres for adult education the total study load didn’t increase that much. Student numbers apparently decreased less, although this evolution is difficult to analyse, because the number of students is calculated differently since the reform. About 8000 students are subscribed in 2008-2009, while roughly 11000 students were subscribed in 2004-2005 at centres for adult education.

So since the 2006 Teacher Training Decree, the legal framework is largely the same for the 40 institutions offering post-graduate teacher training. To stimulate cooperation between the different teacher training programmes, the decree (financially) stimulated institutions to become member of 'expertise networks' with at least one university, one university college and one centre for adult education. These expertise networks should foster cooperation between the three mentioned types of institutions. Some of the main issues that are dealt with within these networks are internal quality assurance, sharing experiences and good practices, and preparing an external assessment.

External quality assurance in Higher Education

In Flanders the responsibility for internal and external quality assurance of their education is assigned to the institutions themselves. So, each institution is responsible for its own internal quality assurance. Additionally, each institution is required to submit its bachelor’s and master’s programmes to an external assessment on an eight-yearly basis and to act on the findings and results of this external assessment. Professional bachelor’s teacher training programmes are subject to this system. Up to now, no institutional audits or institutional accreditation is required. The remit of organising external programme assessments has been entrusted to VLIR (Vlaamse Interuniversitaire Raad – Flemish Rector’s Conference) for the Flemish universities and VLHORA (Vlaamse Hogeschoolenraad – Council of Flemish university colleges), which are the consultative and advisory bodies of the universities and university colleges since respectively 1976 and 1994. Within VLIR and VLHORA a Quality Assurance Unit carries out the external assessments. Those two Quality Assurance Units are recognised by the Flemish Government, are full members of ENQA and are registered with EQAR.

The external quality assurance system serves a twofold purpose: it is intended to help improve the quality of education, and it helps the institutions to account for the way in which they address quality and quality assurance in the context of a programme.

Essential features of the external quality assurance system are that it takes a programme or cluster of programmes as its starting-point, that it is organised along inter-institutional lines and that it starts with a critical self-evaluation report which the programme coordinators are required to write. A panel of independent experts composed in consultation with the institutions then visits the programme(s), forms a judgement on the quality and formulates recommendations for improvement. The process is concluded with the publication of a
public assessment report. The reports include a comparative description and comparative tables, but do not have the aim to rank programmes. The programmes are assessed checking 21 quality aspects, which together constitute a programme’s quality profile. So, it is up to the reader of the reports to judge which aspects are most important to him/her and thus to evaluate which programme fits most his/her needs.

On the basis of the assessment framework and the panel’s own discipline-specific referential framework (with this framework, the panel specifies the minimum domain specific requirements it believes the programmes should satisfy), the panel assesses the various quality aspects and explains its judgement on each quality aspect in the final report. The panel likewise expresses this judgement in quantitative terms, on a 4-point scale: unsatisfactory, satisfactory, good and excellent per aspect. At the overarching theme-level (staff, quality assurance, ...) the score is unsatisfactory or satisfactory.

It is a deliberate choice to assign the external quality assurance to the umbrella organisations of the institutions. VLIR en VLHORA believe that a strong feeling of ownership in the programmes for the external assessment process, clearly contributes to the positive approach of the programmes towards external evaluation and creates the necessary openness to discuss potential measures for quality improvement, a vision which is shared by the Flemish Government. Therefore external assessments are organised by the umbrella organisations of institutions. Another way to ensure this ownership is the fact that programmes which have to be evaluated are requested to propose members for the assessment panel. They make a list of preferred chairs for the panel and a long list of potential qualified panel members. On the basis of this list, the panel chair composes the panel. This composition has to be agreed upon by the VLIR and/or VLHORA Board, before the panel members are invited.

As a second objective of the external quality assurance system is for the institutions to account for the quality they are offering, an independent judgement is an essential feature of the system. Strict conditions are in place to guarantee that the proposed panel members are independent. Additionally, the independence of the panel members is checked by the Higher Education Recognition Committee (a standing committee of independent experts which gives advice to the Flemish Government on all kind of higher education matters) before the assessment process starts. Since 2004, accreditation has been added to the external quality assurance system. So, all bachelor’s and master’s programmes assessed by one of the two quality assurance agencies in Flanders have to demonstrate their generic quality as a condition for accreditation. The assessment panels’ judgements counts heavily in this accreditation decision. Flanders and the Netherlands decided to have their higher education programmes jointly accredited, and to this end they established the Accreditation Organisation of the Netherlands and Flanders (NVAO). VLIR and VLHORA developed a joint protocol for the assessment of higher education programmes, which describes the procedures for external assessments of higher education programmes, as well as the assessment framework. The assessment panels judge the programmes concerned on the basis of the six ‘themes’ (covering 21 ‘aspects’) listed in the accreditation framework. The assessment framework envisages to grasp every aspect of a programme, focussing not only on programme and results, but also on goals, staff, facilities and internal quality assurance. After the publication of the assessment report, the higher education institutions have to submit an accreditation application to the NVAO. The NVAO’s decision-making structure is binary: either the programme receives accreditation or it does not. If the accreditation decision about a programme is negative, the board may submit an application to the Flemish government for a temporary recognition. A positive accreditation decision has an eight-year period of validity.

**External quality assurance in post-graduate Teacher Training programmes**

**Legal framework**

The 2006 Teacher Training Decree set basic rules for teacher training programmes’ external Quality Assurance. The methodology used for this was based on the system for higher education and thus on self-evaluation, followed by external assessment by peers. All programmes have to be assessed in one cluster and the report will be made public by the end of 2012. The main difference in comparison to higher education is that the assessment isn’t followed by an accreditation procedure. Instead, a policy review by the Flemish Government is planned on the basis of the assessment report. The coordination of the external assessment has been assigned to the Quality Assurance units of VLIR and VLHORA.

**History**

Although preparations for an external assessment of the teacher training at the Flemish universities started already in 2004, the external assessment itself has been postponed due to the thorough reform which was in
preparation at that moment. So, the planned external assessment will be the first external assessment focussing specifically on the quality of teacher training programmes at the Flemish universities and the university colleges. As the assessment framework is based on the one for higher education, central administrations and staff involved in other programmes at the involved higher education institutions already have relevant experience in preparing the external assessment.

Until the new Teacher Training Decree came in place, post-graduate teacher training programmes offered by centres for adult education, were subject to inspection by the Flemish Government. Inspection was based on a Context Input Process Output-model (CIPO-model). Each centre for adult education has been assessed at least once since 2000. So, these programmes have experience with external assessment, but change to a system of peer assessment, with a new assessment framework.

Common project
It was decided to make this assessment a real common project of VLIR and VLHORA. In each organisation a project officer was given the responsibility for this project and a Task Force has been formed which has the responsibility to execute the assessment of the teacher training programmes. For some other higher education programmes which are a result of cooperation between universities and university colleges, the two quality assurance agencies also have a shared responsibility. Up to now this shared responsibility has been implemented pragmatically, i.e. one of the two agencies organised the assessment and the other was informed about the procedure and had an observer function to make sure the procedures were implemented correctly. So, the clustered assessment of post-graduate teacher training programmes is the first external assessment in Flanders which is really organised by VLIR en VLHORA together. Although VLIR en VLHORA designed a common protocol and procedures for assessing higher education programmes, the implementation is often slightly different. As a consequence, every step in the procedure has to be evaluated on how to design it best for this assessment, taking into account the specific characteristics of post-graduate teacher training programme. Having to take conscious decisions on every step of the process, costs a lot of time and energy, but leads to carefully designed procedures and a process which should be even more fit for purpose than other assessments done by VLIR or VLHORA.

Preparation of a protocol for external assessment of teacher training programmes
In preparation of the external assessment, VLIR and VLHORA brought together representatives of the teacher training programmes of all types of institutions and the Flemish Government. A working group of 15 representatives of the institutions, a representative of the Flemish Government and the project managers of VLIR and VLHORA was established. This working group met several times in 2008 and 2009 to adapt the assessment framework and procedures VLIR and VLHORA are using for higher education programmes. Several meetings were needed to get to know each other better and to find a common vocabulary. Indeed universities and university colleges on the one hand and centres for adult education have had for long a completely separate legal framework and didn’t work together a lot until recently. So a certain time and number of meetings were needed to adapt the language used by VLIR and VLHORA to match it with the language used by centres for adult education. After this process, the protocol for external assessment of teacher training programmes (including an assessment framework and all relevant procedures) was approved by all parties (not only VLIR and VLHORA, but also the Steering Group Adult Education, who is representing the centres for adult education to the Flemish Government) involved in October 2009. In the end, the process has led to an assessment framework and procedures which are “fit for purpose”, a principle also laid down in the ENQA European Standards and Guidelines.

The adapted assessment framework envisages as well as the original VLIR-VLHORA framework to grasp every aspect of a programme. It focuses not only on teaching staff and results but also on goals, content (the curriculum), facilities and internal quality assurance. The adapted framework exists of those six themes covering eighteen aspects which will be evaluated by the assessment panels. The themes and aspects are indicated in Table 1.
Table 1: Assessment framework

Theme 1 Aims and objectives of the programme
Aspect 1.1. Level and orientation of the programme and discipline-specific requirements

Theme 2 Curriculum
Aspect 2.1. Correspondence between the aims and objectives, and the curriculum
Aspect 2.2. Requirements for professional and academic orientation
Aspect 2.3. Consistency of the curriculum
Aspect 2.4. Size of the curriculum
Aspect 2.5. Workload
Aspect 2.6. Coherence of structure and contents
Aspect 2.7. Learning assessment
Aspect 2.8. Admission requirements

Theme 3 Staff
Aspect 3.1. Quality of staff
Aspect 3.2. Quantity of staff

Theme 4 Services
Aspect 4.1. Facilities
Aspect 4.2. Tutoring

Theme 5 Internal Quality Assurance
Aspect 5.1. Evaluation results
Aspect 5.2. Measures for improvement
Aspect 5.3. Involvement of staff, students, alumni and the professional field

Theme 6 Results
Aspect 6.1. Achieved learning outcome
Aspect 6.2. Study progress

The main changes in comparison to the framework for higher education programmes are related to three issues. First, the aims and objectives have been changed because for the teacher training programmes they are based on the specific legal framework, which includes a detailed set of competences a teacher should have. The descriptors of the Flemish qualification framework can’t be applied on the teacher training programmes under evaluation, because the teacher training programmes have not yet been integrated in the qualification framework. Second, no master’s thesis is required in teacher training programmes. The preparatory working group decided not to have separate aspects for the practical component of the programme (pre- or in-service training), because this should be evaluated through the whole assessment framework and should not become isolated as one of the aspects. Third is the integration in one aspect of ‘quality of staff’ and ‘academic and professional orientation of the staff’, as in teacher education didactic and pedagogic expertise are presumed to be both relevant for the way of teaching and the content of the programmes. So, it was decided that an integration of those aspects in one aspect would be better.

Further on, some wordings have been changed in the underlying evaluation criteria and in the clarification which is provided for the assessment criteria.

Implementation of the assessment

Once the procedures were adopted in October 2009, VLIR and VLHORA started the assessment process itself. In defining the timing for the external assessment a balance was sought between offering the programmes some time to implement the new legal framework on the one hand and keeping enough time for assessing all the programmes before end 2012. Indeed the Decree requires the assessment to be finalised by end 2012. Before this time the three phases of the process should be finalised (Preparation, site visits and reporting). In the preparatory phase, which lasts till February 2011, the programmes are informed about the assessment process – including information on and suggestions for writing the self-evaluation report – the assessment panel is put together, the panel’s inauguration meeting is held and the programme coordinators write their self-evaluation report. During the second phase, the project managers discuss the practical aspects of the site visit with the programme coordinators, the latter prepare for the site visit and, finally, the panel visits the programmes. This phase will last until Spring 2012. The assessment process is rounded off with the reporting phase, which will last until end 2012. It covers the compilation of the programme report, the feedback on the reports by the
concerned programmes, the report’s formal submission to VLIR and VLHORA by the assessment panel, and the publication of the report.

**Preparation Phase**
As soon as the protocol for the assessment of the Teacher Training programmes was agreed upon (October 2009), the project managers started to inform the involved programmes. Several information sessions were organised in November 2009 and February 2010. Based on this information the programmes started an extensive self-evaluation process, which should lead to a self-evaluation report by February 2011.

**Composition of the assessment panel**
All post-graduate teacher training programmes at all 40 institutions involved will be assessed by one panel of peers divided in five sub-panels. Every sub-panel will gather four peers that need to be independent experts in the field of education in general and more specific of teacher training and will be accompanied by a secretary who is employed by VLIR of VLHORA. Each sub-panel will also include a student-member. The team of panel chairs will be responsible for the overall consistency of the assessment process. In each panel it is tried to have expertise in pedagogy, didactics, international developments in teacher training, knowledge of Flemish secondary education and the needs in academic, technical and vocational education, the needs of adult learners and quality assurance.

In February 2010 the involved programmes were asked to propose potential panel members for the assessment panel. These proposals have been discussed during a meeting in March 2010. It has been a difficult process to find qualified and independent peers, mainly for panel chairs, as universities, university colleges and centres for adult education partly see different groups as peers. For universities, foreign academics are seen as the main group of peers. As the assessments are done in Dutch, many academics from The Netherlands were proposed by the universities. In university colleges also professional bachelor programmes in teaching (180 ECTS) preparing for pre-school, primary or lower secondary school teaching are offered. So, staff teaching in these programmes were seen as relevant peers – also by centres of adult education – but in the meeting between all stakeholders in March 2010, it was decided that no staff of the involved institutions would be proposed, for reasons of independence. The three types of institutions proposed senior teaching and school management staff of secondary schools. Also, Inspection staff for secondary and adult education were proposed.

In the end the representatives of all involved programmes could agree on a ranked list of potential chairs and a long list of potential panel members, all insisting on balanced sub-panels. After advice of the Steering Group for Adult Education and agreement by the Boards of VLIR and VLHORA, panel chairs were contacted and found during Summer 2010. The team of panel chairs has been completed and has proposed candidates for the completion of the sub-panels. This proposal is being presented to the Steering Group for Adult Education and the Boards of VLIR and VLHORA during September 2010. After agreement of these bodies, the candidates will be contacted. Student-members will be proposed by the Flemish Student Union (VVS). They have developed a selection procedure and provide VLIR and VLHORA since several years with qualified students for assessment panels. They have agreed to select for this assessment students from universities, university colleges and centres for adult education.

To ensure the independent functioning of the assessment panel, safeguards are built into the whole assessment procedure. As described above, the programmes under assessment are only involved in the first phase of the selection of the panel, the chairperson has the option of adding candidate panel members of his own to the list, incompatibility grounds are defined and the candidate panel members are required to sign a statement of independence as a precondition for joining the panel. With the completion and signing of this statement, the members state to act independently in the performance of their role, and not to allow themselves to be influenced in their judgements. The candidates likewise promise to disclose if there is any risk of a conflict of interests or the appearance of such a conflict associated with their participation in the assessment. At the end of the assessment process, the panel members have to sign their statement of independence again, and to declare that they have carried out the assessment in complete independence. Before the panel can officially start its work, its independence is checked by the Higher Education Recognition Committee. This bases its check on the members’ curricula vitae, on the statements of independence, on the shortlists of candidate chairpersons and candidate members and on the Steering Group Adult Education, VLIR and VLHORA boards’ decisions about these. After the composition of the panel has been ratified by the Recognition Committee, the assessment panel is instituted by decision of the VLIR and VLHORA.
Once the panel has been selected and approved by all relevant bodies, its inauguration is the next main step in the assessment process. To prepare for the inauguration meeting the project managers organise a meeting with the chairpersons of the sub-panels to prepare them for their role as chairperson and to discuss how an assessment panel will work. The chairpersons and the project managers also draft a version of a discipline-specific referential framework. With this framework, the panel clarifies the minimum substantive and educational requirements it believes the programmes should satisfy. On the basis of the panel members’ diaries and in consultation with the programme coordinators and the chairperson, the project managers also draw up provisional site visit schedules. During the inauguration meeting the assessment process will be discussed in detail, the education field in Flanders will be presented, the discipline-specific referential framework will be discussed and practical arrangements will be made.

**Site visit phase**

A preparatory discussion of the project managers and the programme coordinators marks the start of the ‘site visit phase’. This discussion is meant to discuss the site visit schedule, the purpose of the various interviews and the groups who are expected to attend each interview. On the basis of this meeting the site visit schedule is adapted based on the specific features of the programme.

During the site visit, the panels will be able to refine their analysis based on the self-evaluation report, meeting all the stakeholders. The panel’s task consists in assessing the quality according to the criteria and in making recommendations to improve the quality of the programmes. Depending on the number of students, the number of locations on which the institution offers the programme and the number of trajectories it offers, the length of an assessment visit can vary from one to five days. The most common visit length is two days (for a standard trajectory). Essential elements of a site visit are, apart from the interviews with the various stakeholders, the panel’s internal consultations, an informal meeting with the stakeholders, a visit to the infrastructure, a free consultation period and any supplementary interviews at the invitation of the assessment panel, the preparation for the oral report and the oral report itself. The panel’s secretary acts as the contact person during this phase between the programmes and the panel for all practical difficulties, takes minutes of the internal consultations and of the interviews and oral report, makes sure that all themes are covered during the interviews and checks that the assessment protocol is applied correctly. For reasons of independence, but also to ensure his ability to monitor the progress of the interviews properly, the secretary does not participate actively in the interviews.

During the site visit a number of **internal** consultations are built into the schedule. A first internal discussion is scheduled before the start of the interviews. On the basis of the self-evaluation report, the assessment panel discusses its impressions regarding the quality of the programme, and determines the points for attention which definitely need to be covered during the interviews. The panel also settles who will be responsible for which themes, along the lines of the task distribution agreed on during the inauguration meeting. Internal consultations also take place as the interviews progress. They give the panel the opportunity to discuss the information obtained and to view the material which has been presented for inspection. A final internal consultation is reserved for the preparation for the oral report, which takes place after the final interview. On the basis of the themes, aspects and criteria, the panel evaluates the programme.

The panel also holds interviews with the relevant stakeholders. Each interview has its own separate purpose and normally lasts from 30 minutes to one hour. If different trajectories are clustered together in one assessment, the interviews with the central levels within an institution are combined. The interviews with the staff and students are held per trajectory. The panel runs the interviews on the basis of the self-evaluation report and the study and other material that has been made available for inspection during the site visit. Each interview is regarded as confidential. To ensure that the interviews remain manageable, the delegations are limited to a maximum of twelve people.

An interview with the **policy makers** within the institution is the first interview, and serves to provide the panel with further information about the institution’s educational policy and the programmes. The interview provides also the opportunity to discuss the panel’s referential framework and the profile of the programme, and at the panel’s request more explanation is provided about themes from the self-evaluation report. Additional information can also be provided about developments which have taken place between the submission of the self-evaluation report and the site visit.
The interviews with **students and teaching staff involved in quality assurance** (students and staff separately) serve to provide an understanding of how the internal quality assurance works, with special attention to the involvement of the students.

Interviews with the **students and graduates** on the implementation of the programme precede the interviews with the members of the **academic staff**, to give the panel members the opportunity to sound out the students’ views about the ideas and experience of the academic staff. Among other things, these interviews are intended to provide the panel members with more clarity about the practicability of the curricula, the workload, the staff’s teaching skills, the coherence of the curricula, and the students’ familiarity with the objective and the structure of the education. They are held without any staff members present, so that the students can talk as freely as possible. During the preparatory visit, the project manager asks the faculty coordinators to give the student representatives the task of selecting this delegation, with the request that they should ensure that the delegation reflects the student body as accurately as possible.

Interviews with **students** provide a picture of students’ experiences in the programme, the teaching methods used, the coherence of the programme, the teaching skills of the staff, the available facilities, etcetera.

Interviews with **graduates** provide, together with the information from the self-evaluation report, a picture of where graduates are employed and how they look back on the programme they attended in the light of this. To ensure the relevance of the interview, during the preparatory visit the project manager asks that alumni be invited who graduated no more than five years ago.

The interview with the **teaching staff** is intended to provide an understanding of their involvement in the education. In addition, the staff provide further explanation about the content, teaching approaches and exams for the programme components for which they are responsible.

The interview with **tutors responsible for guidance in relation to the pre- and in-service training** is intended to provide an understanding of their involvement in the education and on the relation between theory and practice and the cooperation of the programme with secondary schools.

**An informal meeting** enables the panel members to get to know the stakeholders. This meeting takes most often place in the evening in the form of a reception.

During an interview with **the coordinators for study advice and guidance** the panel reviews tutoring and study advice. The programme also includes a **visit** by the panel to the infrastructure, such as lecture rooms, working group rooms, the library, computer rooms and places for self-study.

To give students and members of staff the opportunity to engage in discussion with the panel individually or as a group, a **free consultation period** is arranged. If the panel identifies problems during its site visit and wishes to follow up on them or has further questions about specific themes, it can also invite people to attend the free consultation period. During the preparatory visit the project manager asks that this free consultation period be widely advertised so that everyone is aware of it. The chairperson also informs the discussion partners of this possibility during the site visit.

The last interview that the panel holds is a concluding interview with the **representative policy makers** within the institution and at programme level. This interview is conceived of as a two-way discussion in which the panel provides feedback about its main impressions so far and gives its discussion partners the opportunity to respond.

The assessment visit is concluded with an **oral report** in which the chairperson presents the first provisional findings, conclusions and recommendations to all interested stakeholders. No further discussion with the panel is possible during or immediately after the oral report.

**Reporting phase**

After the visits, the secretary of the sub-panel writes a draft programme report, on the basis of the self-evaluation reports, the notes on the interviews held by the panel during its visits, the internal deliberation and
the oral report. To guarantee consistency of the evaluations over the sub-panels, the draft reports of the first visit of each sub-panel will be discussed by the panel chairs as soon as they are drafted. Also after each semester of site visits, an editorial meeting with the panel chairs is planned. The panel members will be asked for feedback during the whole process. As soon as all programme reports are drafted, an editorial meeting will be organised with the complete sub-panels to discuss the programme reports in detail and to check for consistency in marking. As far as possible, a broad outline of a comparative section for the overall report will also discussed at this meeting. This section should give a presentation of the panels’ main conclusions and recommendations. The panels’ secretaries adapts the reports on the basis of the discussion at the editorial meeting and then present them to the panels for their approval. After they have given their approval, the draft reports are sent together with the associated score tables to the institutions.

Each institution receives its own programme reports only. The institutions will have three weeks to react to factual inaccuracies, and may also make comments of a substantive nature. They are also explicitly asked to indicate whether they have already initiated improvement measures in the time between the visits and the reaction to the programme report. The programmes’ reactions should, subject to the consent of the institutional board, be conveyed to the project manager, who passes them on to the panel members.

The panel discusses the programmes’ reactions to the draft programme reports at a second editorial meeting. The assessment panel has the right to decide whether or not to take account of the programmes’ comments. However, factual inaccuracies are always corrected. In a passage at the end of the draft report, the assessment panel can also indicate whether it assesses positively any improvement measure that the programme has reported. The report is not adjusted to take account of any developments which have taken place after the assessment visit, as the site visit is taken as the final evaluation moment. The panels’ secretaries adapt the draft reports on the basis of the discussion at the editorial meeting, and then presents them to the panel again for its approval. After this has been given, the institutions receive the final version of their programme reports, together with a response from the assessment panel explaining why they have or have not taken account of the programmes’ comments; they also receive the general conclusions of the assessment panel.

The programmes have another three weeks to react to the comparative perspective and, if they are not satisfied with the extent to which the panel has taken their comments into account, they can use the internal appeal procedure or compile an appendix which is included as a reaction in the report.

After the editorial meetings, the project manager completes the assessment report with a foreword by the chairperson of the VLIR and VLHORA and one by the chairperson of the assessment panel, the discipline-specific referential framework, the curricula vitae and the site visit schedules.

As the final step in the assessment process, the project managers organise a formal handover and publication of the assessment report. With the formal handover of the assessment report by the chairperson of the assessment panel to a representative of the VLIR- and VLHORA board, the panel completes its assignment. No less than one week before the handover, the institutions and the panel members receive one or more copies of the printed assessment report. A few days before the handover, a press release, in some cases with a copy of the report, is sent to a number of media organisations under embargo.

The handover takes place in the presence of representatives of the institutions/programmes. After a speech, the chairperson of the assessment panel presents the report to the representative of the VLIR an VLHORA board, who in turn give a short speech. They also give the representatives of the programmes the chance to talk about their experiences of the assessment process. As mentioned earlier, during this occasion the project managers present the independence statement to the panel members again for them to sign a second time. The handover is concluded with a reception.

The report’s publication is consistent with the accountability function that the quality assurance system has in Flanders. This means firstly that the institutions are required to account for the way in which they use the public funding that has been allocated to them and the results they have achieved. Secondly, the students, their parents and employers are supposed to be informed via public reports about the extent to which the programmes meet the quality standards. On the day of the handover, the report is published on the VLIR and VLHORA website. The Flemish Minister of Education also receives a copy.

Different from bachelor’s and master’s programmes in Flanders, the teacher training programmes aren’t subject to accreditation on the basis of the assessment report. However, a policy review of the Flemish teacher training programmes is planned by the Flemish Government.
Conclusions

The first clustered external assessment of all post-graduate teacher training programmes is a challenging process, both for the involved teacher training programmes and for VLIR and VLHORA. VLIR and VLHORA have invested much time to involve all stakeholders in the preparation of the process and to adapt the process to the specific needs of the post-graduate teacher training programmes. This is an interesting learning process and has created a better understanding of the different types of institutions offering teacher training programmes and a fit for purpose protocol for the assessment. Also the strong involvement of all stakeholders in the composition of the assessment panel and its 5 sub-panels, will hopefully benefit a strong ownership of the whole process among all stakeholders.

A main challenge in the assessment process will be to guarantee consistency in the marking between the different sub-panels and between the different types of providers, valuing also the differences. Another challenge which hasn’t resolved yet is the financing of the assessment. Although no specific funding for external quality assurance is provided in the standard funding of the programmes, the Government doesn’t seem very willing to contribute to the costs of the external assessments.
What is Subject Content Knowledge in Mathematics?
On the Implications for Student Teachers’ Competence and Confidence in Teaching Mathematics

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Abstract
This paper builds on the findings of recent studies into the levels of mathematical competence and confidence of primary student teachers. The data from these studies were based on the use of an online assessment tool and surveys of the students who participated in its use. The findings highlighted that students’ subject knowledge was often lacking when assessed using the online assessment. It was also found that those students possessing more advanced mathematics qualifications were less likely to display competence in primary mathematics and that their confidence levels in the subject were lower than their less well qualified peers. These rather unexpected findings were confirmed in a subsequent study and in this paper we reflect on the possible reasons for why this might the case. The importance of the teachers’ role in relation to the confidence shown by pupils was highlighted nearly thirty years ago in the Cockcroft Report which emphasised the way in which a teacher in every lesson conveys, even unconsciously, a message about mathematics which will influence the pupil’s attitude. We argue that these findings point towards the importance of teachers’ beliefs about the nature of mathematics and also draw attention to the contested nature of mathematics itself as a discipline. In particular we are interested in exploring the extent to which student teachers bring with them attitudes based on a strict mathematical formalism, in contrast to a more informal and fallibilistic view. We see the former as being distorted into a form of “mathematical fundamentalism” that can be characterised by absolutism, dogma, strict procedures, rule following and right and wrong answers. The paper reports on findings from a second phase of this research programme in the form of a follow up study into the attitudes and beliefs of student teachers in the Autumn Term 2010.

1. Introduction
Findings from recent studies into the levels of mathematical competence and confidence of primary student teachers (Henderson and Rodrigues, 2008), based on the use of an online assessment tool and surveys of the students who participated in its use, highlighted that students’ subject knowledge was often lacking when assessed using the online assessment. It was also found that those students possessing more advanced mathematics qualifications at SCQF level 6 (SCQF 2003) were less likely to display competence in primary mathematics and that their confidence levels in the subject were lower than their less well qualified peers. These rather unexpected findings were confirmed in a subsequent study by Henderson (2010) and in this paper we reflect on the possible reasons for why this might the case. The importance of the teachers’ role in relation to the confidence shown by pupils was highlighted nearly thirty years ago in the Cockcroft Report (1981) which emphasised the way in which a teacher in every lesson conveys, even unconsciously, a message about mathematics
which will influence the pupil’s attitude (para 345). We argue that these findings point towards the importance of teachers’ beliefs about the nature of mathematics and also draw attention to the contested nature of mathematics itself as a discipline. In particular we are interested in exploring the extent to which student teachers bring with them attitudes based on a strict mathematical formalism, as discussed by Lakatos (1976) for example, in contrast to a more informal and fallibilistic view. We see the former as being distorted into a form of “mathematical fundamentalism” that can be characterised by absolutism, dogma, strict procedures, rule following and right and wrong answers. In turn this is reinforced by high stakes testing and results in alienation from the subject itself. The paper reports on findings from a second phase of this research programme in the form of a follow up study into the attitudes and beliefs of student teachers in the Autumn Term 2010.

2. Student Teachers’ Competence and Confidence in Teaching Mathematics

Initial teacher education seeks to produce teachers whose pedagogical skills are such that they can create effective learning situations that will improve understanding in their pupils. In relation to mathematics, Ma (1999) argues that the type of pedagogical content knowledge (PCK) (Shulman 1986) necessary to achieve this is only possible if deep, broad and thorough subject matter knowledge (SMK) exists (Shulman 1986). It would seem obvious to state that in order to be able to teach a subject effectively knowledge of that subject is a pre-requisite. Anecdotally we may know teachers who are excellent mathematicians but whose teaching skills leave a lot to be desired. The converse of this is that some teachers whose mathematical skills are not well developed can still teach the subject effectively. There is evidence to refute this; teachers’ knowledge of a topic influences the questions they ask their pupils (Bennett, Carré and Dunne 1993); Simon and Brown (1996, p.7) found that “gaps in subject knowledge undermine the common rationalisation of teachers’ authority in the classroom” (cited in Brown, Askew, Baker, Denvir and Millett 2001); feelings of inadequacy over SMK have been shown to lead to an over-reliance on commercial schemes (Millett and Johnson 1996); Rowland, Martyn, Barber and Heal (2000) reported that student primary teachers without strong subject knowledge are likely to perform poorly in mathematics teaching when assessed, even towards the end of their training. As Shulman (1986) asked,

“What prices are paid when the teacher’s subject matter competence is itself compromised by deficiencies of prior education or ability?” (p.8).

Against this background an initiative was taken to address the limitations of SMK on the part of student primary teachers at a UK University through the creation of an instrument known as the Online Maths Assessment (OMA) which aimed to identify and address deficiencies in mathematics content knowledge and skills. It also aimed to raise students’ awareness of the mathematics topics in which proficiency was sought, as well as the levels of competence required for the primary school. It was decided to investigate the reasons behind the differential levels of student engagement with the OMA which was observed, in order to enable further development of the assessment tool and also to encourage wider and deeper engagement. The intention was that a sound foundation of SMK could then be transformed into effective PCK through the mathematics component of the teacher education course. To this end numerical and qualitative data were collected from a sample of student primary
teachers \((n = 80)\) about the factors that might be associated with the different levels of engagement. In particular the following research questions were addressed:

1. Why do some students stop at a tutor-determined, pre-set threshold and others improve on it?
2. What factors are associated with differences in how students engage with the OMA?

**Methodology**

All Bachelor of Education (BEd) primary student teachers \((n = 270\) in 2007-08) are required to reach, maintain and hopefully improve upon a minimum threshold score of 80% in the OMA in each year of the programme. When the results were scrutinised by a visual inspection, it was apparent that the number of times students engaged with the OMA varied according to the following pattern which placed the students in one of the following four groups:

A. Those who had 1-2 attempts and stopped at or just over the threshold (80% or 83%);
B. Those who had multiple attempts (3 or more) and stopped at or just over the threshold (80% or 83%);
C. Those who had multiple attempts and scored more than 5% over the threshold (87% or over);
D. Those who had 1-2 attempts and scored more than 5% over the threshold (87% or over).

A questionnaire with a stratified random sample of students \((n = 80)\) was then used to ascertain gender, age, highest mathematics qualification possessed and reasons for the number of attempts taken to complete the OMA.

**Data analysis**

The number of students in each of the four groups is displayed in table 1, along with a fifth column for those students who did not complete the OMA by its closing date. The percentage figures are based on the whole BEd cohort.

<table>
<thead>
<tr>
<th>Group</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>None</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numbers (%)</td>
<td>36 (13%)</td>
<td>49 (18%)</td>
<td>100 (37%)</td>
<td>80 (30%)</td>
<td>5 (2%)</td>
<td>270 (100%)</td>
</tr>
</tbody>
</table>

**Table 1: Distribution of students across the groups**

As can be seen from this table, two thirds of all students are in Groups C and D, indicating that the majority of students on the programme are either competent enough to achieve a score above the threshold, or motivated enough to continue trying the OMA until they achieve a score higher than the threshold.

When asked in the questionnaire why they stopped engaging with the assessment when they did, the students responded as shown in table 2.

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1 It should be noted that the number of questions in the OMA is the reason that the percentages jump from 80% - 83% - 87%, rather than in single percentiles.
Table 2: Categories of response to the threshold score by group

<table>
<thead>
<tr>
<th>Groups</th>
<th>Categories of response</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Achieved the threshold; time pressures prevented them from continuing</td>
</tr>
<tr>
<td>B</td>
<td>Achieved the threshold; time pressures and stress prevented them from continuing</td>
</tr>
<tr>
<td>C</td>
<td>Wanted to improve upon the threshold score</td>
</tr>
<tr>
<td>D</td>
<td>Happy with above-threshold score</td>
</tr>
</tbody>
</table>

These responses are considered under the emergent themes of ‘Meeting the threshold’, ‘Time management’, ‘Stress’ and ‘Personal Success’.

Meeting the threshold
Although students in Groups A and B gave similar responses for stopping at or just above the threshold, the reasons behind these were somewhat different. Group A students thought their job was done once they reached the threshold, despite the fact that 80% had always been suggested as the minimum score to be achieved. Some cited lack of motivation to do more, others even appeared annoyed that they may be wasting their time on it. Some of their reasons are given here.

Two reasons really, firstly knowing that I got the required percentage meant that I didn’t feel the need or motivation to try again. Secondly, lack of thinking about it, although we had months to do it, after I completed it when we were initially spoken to about, it kind of just went to the back of my mind until just before the deadline when I checked that I had completed it.

No motivation to keep trying as had reached the required percentage.

Similar responses were given by Group B students.

I stopped because I had achieved the pass mark.

I had reached the threshold

Stopped once I reached over 80% because I didn't want to get a lower score.

This last student had misunderstood that it was not the last score that was used when the results were scrutinised but the highest.

Time management
Both Group A and B students cited lack of time for not improving on the threshold, with Group B students stating good intentions to access the assessment again at a later date.

I was under time pressure with other things. (A3)
I ran out of time. I knew the cut-off mark was 80% and when I achieved this, I thought I would go back to it but with so much other work, I couldn't find the time. (B2)

Managed to reach the percentage required and decided I would do a re-fresher over the summer break again. (B3)

Purely through lack of time. I would like to keep using the online maths assessment as it is such a useful tool but often other things take priority. (B3)

**Stress**

Group B students recognised their poor competence in mathematics yet found the OMA process quite stressful. Because I’m not great at maths, the less I have to do, the better for me, so when I reached the level, I thought that was enough.

I did not intentionally stop sitting the assessment when I reached 80% as I knew I still had to improve but I think it was mostly just the fact that I knew I did not have to get any higher. Another reason is because maths is not a subject which I enjoy the most of all subjects, therefore I was not over eager to complete the assessment again as it caused me a fair bit of stress when completing it.

I was getting closer to the deadline and was becoming more and more stressed out, so once I knew I had reached the cut-off I stopped!

Group A students appeared to be more accepting of their levels of mathematics competence compared to those in Group B. Once the former had reached the threshold they had fulfilled what was required of them and did not feel compelled to do more, while the latter had to have several attempts to reach the threshold and often became stressed in the process. Students in these two groups, while only one third of the entire student cohort, represent a significantly large enough proportion to cause concern. Despite their reasons of lack of time or stress, the same course demands were on them as on their peers.

**Personal success**

The responses from Group C students showed a marked contrast with those in Groups A or B. They continued to engage with the OMA because succeeding in it appeared to be important to them.

I wanted to achieve the best mark I could. I actually achieved 100% and pointed out an error in the computer answers.

I did not want a minimal pass, so I tried again to get a better score.

I feel as a teacher any less than 100% is unacceptable.

Determination to get a better result than only just the accepted percentage.
I just wanted to keep on trying because I knew I could do better. I tried it then refreshed myself on how to do the ones I had got wrong before trying again. It frustrated me that even though I had got above 80% I was getting silly questions wrong.

There is a sense of commitment from these students to improve their levels of competence that is not apparent in Group A or B students. There is no mention of time constraints or stress from continuing to access the OMA; rather there is a recognition that improving on the threshold score would be of benefit to them in their chosen profession, as well as a sense of determination to continue improving.

Group D students were able to reach scores above the threshold in one or two attempts and their reasons, as might be expected, centred round their recognition that their scores were more than satisfactory.

I had one attempt and was pleased with the level I reached. I trust my own maths ability so I did not feel I had to resit.

I obtained 93% on both attempts and on both occasions it was due to silly errors that I dropped two marks.

I thought 90% was a satisfactory score and therefore didn’t feel the need to improve.

I completed the test in one go achieving 90%, however spent some time looking at the solutions to areas I had got wrong.

Findings
The findings from this study revealed particular group characteristics, highlighted issues related to subject knowledge and affirmed the importance of the affective dimension. Each aspect is discussed in the following sections.

Group characteristics
Ideally all mathematics teacher educators would want their student teachers to belong to Group C. The students in this group, despite sometimes having mixed experiences of mathematics when they attended school, were motivated enough to continue attempting the OMA until they were satisfied with their above-threshold scores. In addition, they reported good or growing levels of confidence in their mathematics ability.

The Group A students did not appreciate that achieving 80% in the OMA highlighted the fact that there was 20% of required knowledge and skills they did not possess. They made excuses about why they stopped when they did, often citing that as they had reached the threshold, they had done what they were asked to do. Complacent is perhaps a better description of this group. In her study of 432 post-graduate student primary teachers, Goulding (2003) confirmed the existence of such a group following an audit of their mathematics knowledge and skills.

The Group B students needed several attempts to get to the threshold but then stopped. The fact that they needed multiple attempts should have suggested to them
that their knowledge and skills required further revision. However, they, like the
students in Group A, made excuses for not continuing beyond the threshold. The
Group C students, on the other hand, were committed to achieving the best results
they could and invested time and effort into so doing. Unlike students in the other
groups, those in Group C did not use the excuses of shortage of time or stress for not
engaging with the OMA. Instead they identified with the importance of improving
their knowledge and skills.

Group D students had achieved high scores in a minimum number of attempts so it
was expected that students in this group would have high levels of confidence given
that their competence was not in doubt. It was therefore interesting to discover that
these students were quite mixed, confirming a previous study, in which high levels of
competence were also not always accompanied by confident attitudes (Henderson and
Rodrigues 2008). Assuming that students who achieve a high score on a mathematics
competence test are secure or confident in their knowledge or skills cannot be taken
for granted. It does appear to be the case, however, that a positive attitude and
engagement in improving OMA scores can lead to increased levels of confidence and
motivation by students to improve further.

**Subject knowledge**
This study was undertaken after it had become apparent that there were concerns
about students’ mathematics knowledge and skills. In their study Hill, Rowan and
Ball (2005) reported that knowledgeable teachers may provide better mathematical
explanations, produce better representations of concepts, hear and understand their
pupils’ responses the better to direct them in their learning, and have more
understanding of how the different branches of mathematics connect. In other words,
these knowledgeable teachers have made the transformation from SMK to successful
PCK.

Instead of being able to rely upon a sound knowledge base, it has become increasingly
necessary to teach the content as well as how to teach the content. Yet there is little
time in teacher education courses to make up for any deficit in content knowledge.
The onus is then placed on the student to address any deficiencies in SMK and, as this
study has shown, the motivation for students to do so can be mixed. It appears to be
the student’s own realisation that spurs them from the conscious incompetence stage
to address inadequacies in their knowledge so that they can reach the conscious
competence stage (Luft and Ingham 1955, cited in Perkin 1999). This appears to be
the effect that engagement with the OMA had on the Group C students. This study
has shown that the use of a tool such the OMA can go some way towards improving
SMK, with the added advantage that this improvement may lead to increased levels of
confidence, resulting in increased motivation to engage further with it.

**Affect**
In addressing the knowledge, beliefs and attitudes of mathematics teachers, Ernest
(1989) distinguished between the cognitive outcome of knowledge and the affective
outcomes of attitudes and beliefs in teacher education, going on to say that teacher
educators must differentiate between the two. As posited by Szydlik, Szydlik and
Benson (2003) the prevailing beliefs of student teachers about mathematics are
hindering positive and productive mathematics learning. This study drew attention to
a link between the acquisition and improvement of mathematics knowledge and the
attitudes and beliefs that student teachers hold. It can be posited that the Group C students’ continued engagement with the OMA led to success which in turn led to further attempts. So while this study set out to improve the SMK of student primary teachers, it became apparent that the reasons for the different patterns of engagement with the OMA were influenced by affective factors as much as cognitive ones, although improvement in the cognitive, that is, increases in OMA scores, often led to improved confidence and attitudes.

Accordingly it was decided to focus attention in the second phase of this study on student teachers’ beliefs and attitudes towards the subject and on the nature of mathematics itself. In our view such affective aspects have been neglected in the process of reform over recent decades. This is despite what we have known since the Cockcroft Report (1981) which highlighted the way in which a teacher in every lesson conveys “even unconsciously, a message about mathematics which will influence [the pupil’s] attitude” (para 345). Furthermore we argue that these findings point towards the importance of teachers’ beliefs about the nature of mathematics in the formation of such attitudes. In particular we are interested in previous research which shows that differing conceptions on the nature of mathematics have an influence on the ways in which teachers and mathematicians approach the teaching and development of mathematics (Thompson, 1984; Cooney, 1985). This brings us to questions related to the nature of mathematics itself.

3. On the Nature of Mathematics

If we look to the history of the development of the discipline of mathematics, it can be seen that the nature of the subject itself has long been contested. This has profound implications for school mathematics - for example is it an abstract subject for an elite or should mathematics be for all? In the analysis contained in his seminal text Lakatos (1976) distinguishes between the deductivist approach and the heuristic approach which he describes as “the logic of proofs and refutations”. With regard to the former it is argued that Euclidean methodology developed a certain obligatory style of presentation which is described as deductivist style:

This style starts with a painstakingly stated list of axioms, lemmas and/or definitions. The axioms and definitions often look artificial and mystifyingly complicated. One is never told how these complications arose. The list of axioms and definitions is followed by carefully worded theorems. These are loaded with heavy-going conditions; it seems impossible that anyone should ever have guessed them. The theorem is followed by proof.

Lakatos (1976, p 142)

Mathematics is compared with a conjuring act according to this "Euclidian ritual" and the student is obliged to accept this without asking questions about the underlying assumptions. In this deductivist style, under which all propositions are true and all inferences valid, mathematics is presented as an ever-increasing set of eternal, immutable truths. We argue that it is not simply the dominating influence of this deductivist approach which is a main problem for the teaching and learning of mathematics in schools today but rather the way in which this has become distorted into a form of fundamentalism that is akin to religious fundamentalism.
We argue that such a fundamentalism promotes an authoritarian view of mathematics, which hides the struggle and adventure involved. In turn such authoritarianism is the very antithesis of the conditions needed to foster independent and critical thinking. An alternative perspective, which we describe as mathematical fallibilism (Lakatos, 1976), argues for a view of mathematics as human activity and that it is this human mathematical activity that produces mathematics. However when it is presented in textbooks this product of human activity “alienates itself” (ibid, p146) from the very human activity, which produced it. The mathematics educator Geoff Giles used the expression which captures the essence in a very vivid way for us of “dead geometry entombed in text books”. This stands in stark contrast, for example, with the present day opportunities afforded by the use of dynamic geometry software to enable students to independently study the invariant (unchanging) relationships between points, lines and circles, forming their own conjectures and testing them out visually, which is the very essence of geometry. Such diametrically opposing viewpoints about the nature of mathematics are captured in Table 3 below:

<table>
<thead>
<tr>
<th>Mathematical fundamentalism</th>
<th>Mathematical fallibilism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infallible and authoritarian</td>
<td>Fallible and liberating</td>
</tr>
<tr>
<td>Dogmatic and absolutist</td>
<td>Growth and change</td>
</tr>
<tr>
<td>Irrefutable and certain</td>
<td>Refutable and uncertain</td>
</tr>
<tr>
<td>Strict procedures</td>
<td>Multiple solutions</td>
</tr>
<tr>
<td>Rule following</td>
<td>Creative reasoning</td>
</tr>
<tr>
<td>Right and wrong answers</td>
<td>Errors and mistakes</td>
</tr>
<tr>
<td>High stakes testing</td>
<td>Evaluation &amp; self assessment</td>
</tr>
<tr>
<td>Boring</td>
<td>Engaging</td>
</tr>
<tr>
<td>De-motivating</td>
<td>Motivating</td>
</tr>
<tr>
<td>Fear and anxiety</td>
<td>Enjoyment and fulfilment</td>
</tr>
<tr>
<td>Alienation from the subject itself</td>
<td>A creative human activity</td>
</tr>
</tbody>
</table>

Table 3: The contested nature of mathematics

Accordingly this table was used as the basis of the questions in a survey of initial teacher education students in relation to their beliefs about and attitudes towards mathematics in the Autumn Term of 2010. The survey was conducted with a sample of student teachers enrolled on Years 1 to 4 of a Bachelor of Education (BEd) Honours degree programme and a Post Graduate Diploma in Primary Education (PGDPE) course during the week beginning 12th September 2010. It was completed by 148 student teachers across the five cohorts.

4. On Student Teachers’ Beliefs about and Attitudes towards Mathematics

Our findings based on an initial analysis of the survey results will be presented at the TEPE Conference in Tallinn.

References


Teacher Education in the Context of Improving Quality in Higher Education in Poland

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1. Introduction

In this text I wish to focus my considerations on – in general terms – the issue of a quality of teachers' education, which is one of the key subjects appearing in the current debate on the directions of educational policy in the EU. I pay attention on opportunities and limitations which the latest proposals of the Polish Government concerning the improvement of the quality of higher education may create. In the central point of the discussion undertaken in this text I place the challenges that education of teachers is facing nowadays in the context of improving the quality of education at the university level.

In the discussions on education in Europe, it is pointed out that quality and efficiency of education is to a large extent dependent on teachers' professionalism and the degree of professionalisation among teachers. Teachers' work is recognized as the most important factor influencing the quality of education at school (Abbott, 1988; Hattie, 2003). At the same time it is stressed that the quality of teachers depends on the quality of their teacher education and this is reflected in recent European policy documents published by the European Commission (European Commission, 2005; 2007) or the European Council (European Council, 2007). In 2002, the Council of Europe, at its meeting in Barcelona, stated that teachers play the key role in all important issues for economic and social development. It is emphasized in educational literature that in facing the challenges that schools and teachers have to cope with, a great role is played by the quality of university education, and especially by the quality of university and college teachers' work. Scientific research on academic teachers show that just as the quality of teachers' work has an impact on the results of their pupils' education (Darling-Hammond, 1999), the quality of university and college teachers' work – especially of teacher educators – and the resulting quality of education in the Institutions of Higher Education have an impact on the outcome of future teachers' education and their professionalism (Buchberger, Byrne, 1995; Buchberger, 2000; Korthagen at all, 2006). Thus the issue of improving the quality of teachers' education occupies a priority position and is one of the main goals of the process of reforming educational systems in the European countries. The attention devoted to the quality of teachers' work and the quality of education is reflected in the research priorities concerning teaching, learning, teachers' professional development and school leadership, which is, for example, exemplified by the project entitled Teaching and Learning International Survey, launched in 2006.
2 Teacher education in Poland: towards improving quality

This section explores something of the specificity of teacher education in Poland. It describes some of the main features of teacher education and the main assumption about the work of teacher educators in Poland and its conditions. The considerations presented below focus on Polish educational policies and practices acting to structure the national and institutional contexts for teacher educators’ work and identities.

2.1 Context for teacher education – the latest proposals of the Polish Government concerning the improvement of the quality of higher education

The current context for teacher education in Poland is partly shaped by the shifting social, economic and political circumstances, whether local, national or global in nature. Following the downfall of the socialist regimes in 1989, system transformations have taken place primarily in the political, social, cultural and economic areas in Poland. New political legislation became the basis for changes in Polish education. From being a centrally planned, hierarchical and closed educational system, it has been transformed into a more open and highly decentralised system of governance. The new legislation (introduced on 1. September 1999) permitted the development of non-state schools (at all levels of education) and changes in the structure of enrolment at the upper secondary level (a higher percentage of young people attending general secondary schools), as well as the doubling of the number of students attending higher education institutions (Michalak, 2005). The reform of the State administration system and the education reform assume that only the national educational policy will be developed and carried out centrally, while the administration of education and the running of all types of schools, pre-school institutions and other educational establishments are decentralised. Each school is administered locally and possesses a high degree of autonomy. Each school has a good amount of control over its own decisions and destiny (Michalak, 2007).

In the current legal environment, all issues connected with the system of higher education are regulated in the Act of 27 July 2005 “Law on Higher Education” and in the “Act on Scientific Degrees and Titles” of 14 March 2003.

The higher education in Poland is one of the most dynamically developing areas of social life. In the last 20 years, rapid quantitative and institutional changes have taken place. Since the beginning of the change in polish political system, the number of students has increased almost fivefold and more than one third of this rise consists of students from the non-public institutions of higher education. In total, over a half of all these students participates in commercial forms of education. At present, almost 2 million students study in 458 institutions of higher education – 132 public ones and 326 non-public ones.
### Table 1. The number of the institutions of higher educational

<table>
<thead>
<tr>
<th>Academic year</th>
<th>Institutions of higher education in total</th>
<th>Non-public institutions of higher education</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992/1993</td>
<td>124</td>
<td>18</td>
</tr>
<tr>
<td>1995/1996</td>
<td>179</td>
<td>80</td>
</tr>
<tr>
<td>2000/2001</td>
<td>310</td>
<td>195</td>
</tr>
<tr>
<td>2005/2006</td>
<td>445</td>
<td>315</td>
</tr>
<tr>
<td>2008/2009</td>
<td>458</td>
<td>326</td>
</tr>
</tbody>
</table>

In the last two decades, when the number of students increased from 403 thousand in the Academic Year 1990/1991 to 1,930 thousand students in 2007/2008 – which is commonly considered to be one of the greatest achievements of the political system change – the financial support per student of the public institution of higher education has been low (3 or 4 times lower than in the leading European countries) and it is still getting lower, due to the fact that the number of students increased much faster than the general amount of money earmarked for higher education.

This impressive and abrupt increase in the number of university and college students in Poland, which is emphasized in many international reports, has brought about many various positive effects: made higher education more accessible, postponed introduction of great numbers of young people into a very difficult job market and improved the earnings of numerous university and college teachers. However, it has also produced negative outcomes: manifold and long-lasting overburdening of higher education teachers delayed their development and declined the level of their scientific work, as a result the quality of studies at popular specializations has decreased especially at very popular specializations¹ and the value of their diplomas and degrees has become impossible to measure. The fact that a reliable and solid educational market based on a calculable and comparable quality of studying and diplomas has not evolved contributes to such a situation. Still there are no legal and institutional mechanisms of translating the quality of higher education teaching staff and their workload into an assessment of the level of the institution of higher education and its diploma. Similarly, the quality of the staff and the way it is used do not influence the level of financial support earmarked for a university or college.

While identifying the weaknesses of the Polish system of higher education, the following elements should looked into:

¹ Nowadays, students in Poland are educated on over 200 specializations, including some unique ones and some macro-specializations. The greatest number of students studies at the following specializations: economic and administrative (23%), social (23%), pedagogic (12%), liberal (8.8%), engineering and technological (6.8%), medical (5.8%), IT (4.9%), services (3.7%), legal (3.1%) and environmental protection (1.4%) (other specializations are attended by 16.4% of students).
- **Lack of qualitative mechanisms in the financing system:** in the present financing system for the institutions of higher education in Poland not only is there no special financial support that would reward the institution for its quality of research and education, but also the significance of qualitative elements in the current algorithm for dividing stationary financial support is negligible.

- **Low rate of internationalization of studies:** the index that is often used to measure the level of internationalization of higher education is the ratio of foreign students to the whole student population. In Poland it amounts to 0.5%. It is 0.9% in Slovakia, 3.3% in Hungary, 6.3% in the Czech Republic and the average index for the OECD countries amounts to 9.6%. These statistical data show that educational offer at Polish universities and colleges remains comparatively unattractive for foreign students.

- **Incorrect structure of educational specializations:** social and pedagogical specializations are disproportionally popular, especially in the non-daily form of studies, which does not meet employers' expectations. There are too few graduates from scientific, technological and health-oriented specializations. For the state, it means endangering future rate of socio-economic development, and for individuals it means that having a degree increases earnings in Poland only by 28%, while in the USA by 76.8%, in Portugal by 68.8%, and in France by 64.4%. What is more, Poland is ranked 19 in the EU as far as the level of adjusting higher education to the needs of economy is concerned.

- **Complicated academic career path:** in Poland, in the last 20 years the number of defended doctoral dissertations has risen threefold, which has not been reflected in an equally rapid increase of university teachers with the title of a habilitated doctor – permitted to, for example, do their independent scientific research or performing supervisory functions. As a result of this slowing down of an academic career, the age structure of the Polish academic and scientific community is very unfavourable. University teachers and scientists gain independence at a very late age. The deficit of the influx of young university and college staff is especially visible in comparison with rapidly rising number of students that has taken place in the last 20 years.

- **System of managing the institutions of higher education:** almost all international organizations' reports, such as OECD's or World Bank's, that regularly evaluate Polish higher education stress the need to modernize structures of the institutions of higher education, which in their present form do not facilitate building up their international position.

- **Weak link between the institutions of higher education and their socio-economic environments:** still the collaboration of the institutions of higher educations with the employers' community from public, commercial and non-governmental sectors is too weak. The educational offer of the majority of Polish universities and colleges is arbitrary; it is inflexible and rarely externally assessed in terms of educational results. In terms of research, Polish institutions of higher education, apart from very few exceptions, created too weak institutional mechanisms of gaining funds (contracts) for research and preparation of expert opinions for external institutions, especially commercial ones. Moreover, the OECD indicates the need to create greater employers' engagement, both public and non-public, in creating and evaluation of university and college curricula.
The absence of Polish institutions of higher education in the group of universities and colleges recognized worldwide for their high quality research or teaching is the most visible result of the lack of policy – in the past and now – directed at improvement of qualitative indexes. Thus, according to the Ministry of Science and Higher Education, increasing the quality of studies and of efficiency of the higher education system becomes a priority.

Nowadays, work on amendments to the act on higher education in Poland takes place. The suggested legal changes result from the need to adjust Polish higher education system to an unprecedented scale of increase in the number of tasks which it is facing and also to harmonize it with the solutions introduced in the European High Education Area.

The proposed amendments to the act on higher education, which are to be officially introduced on 1. October 2011, concentrate on three areas:

- efficient model of managing higher education,
- dynamic model of academic career,
- effective educational model.

These changes are in full accordance with the strategic goals presented in the Cabinet's document entitled “Poland 2030. Developmental challenges”2. According to the Government's plans, the proposed changes will be considered successful if the ratio of the number of students to a habilitated doctor decreases, the number of university and college teachers employed in more than one post goes down as well, the number of students studying free of charge increases, the amount of public financing granted to universities and colleges in a competitive way increases, and the positions of Polish institutions of higher education in European and world rankings go up.

One of the key means aimed at achieving the aforementioned goals is the creation of reasonable financing mechanisms for higher education based on the outcomes of research and teaching work. In order to achieve it, the financing system is to be altered in such a way that greater and greater part of funds will be distributed through competitions and tenders and the scale of state financing will depend on the quality of results, both in teaching and research.

The second key means of achieving these goals is to integrate curricula with the European High Education Area and thus increase students' and university and college teachers' mobility through:

1) deregulation of teaching standardization and increasing the autonomy of institutions of higher education in terms of creating specializations and curricula in accordance with the National Qualification Framework within the Bologna Declaration;

2) closer links between institutions of higher education with external sector and economy through including practitioners in the work on university and college curricula and teaching;

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2 On 17 June 2009 the Board of Strategic Advisors published the ‘Poland 2030 Report’. The Report is a summary of an analysis of development dilemmas faced by Poland. Resolution of the dilemmas will have a crucial effect on the further development of Poland, in a time perspective of one generation – in about 20 years’ time. The Poland 2030 Report was created by the Board of Strategic Advisors to the Prime Minister of Poland and edited by Minister Michal Boni.
3) greater internationalization of institutions of higher education through involving foreign university and college teachers an Polish ones working abroad in the national education and wider opening of institutions of higher education to foreign students;

4) shortening career paths of researchers and teachers through simplifying habilitation procedure for Polish scientists and researchers and making equal the status of independent scientists and researchers working in Poland and abroad.

The solutions concerning the graduate and postgraduate students also constitute a very important element of the reform. They are aimed at lifting barriers, especially for students coming from less well-to-do families, through creating a modern grant system, increasing financial means for social assistance for students, simplifying procedures and facilitating the system of guaranteeing students loans. The protection of students rights will be ensured through introducing obligatory contracts between students and institutions of higher education. On the other hand, effective mechanisms linking institutions of higher education with labour market will increase the level of preparing graduates for the needs of employers.

The proposals presented for the area of university and college management primarily aim at reshaping university and college financing and increasing their autonomy in teaching matters. Institutions of higher education – as educational politicians plan – will be freed from complicated administrative procedures and the best of them will gain complete freedom in creating original, innovative and interdisciplinary specializations. The suggested stronger link between forms of financing and effects of teaching and research will assist in promoting the best of them.

The proposed systemic solutions, which in an evolutionary way will modify legal environment in which Polish institutions of higher education function, endeavour to provide:

- better quality for Polish students, thus better preparation for changing economy;
- opportunity for Polish scientists and researchers to participate in the greatest world research projects;
- prospects of steady development of Polish institutions of higher education and constant increase in their teaching and research potential.

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3 Specially dedicated funds, earmarked on the basis of honest competitions, will reinforce the best academic centres. National Leading Scientific Centres will be selected. It will be the first step to creating such institutions of higher education in Poland that stand out in quality of scientific research and teaching among European counterparts. Those institutions of higher education which thanks to their integration with regional job market, economic environment and social environment will carry out scientific and research tasks for their region and as a result will obtain excellent mark from the State Accreditation Committee will also gain priority treatment. One of the instruments which will enable the most dynamic cooperation with socio-economic environment will be the possibility of appointing the university rector following an open contest for the position and giving him more competences and responsibilities.
2.2 Teacher education: overall characteristic (institutional structure)

Teacher education is part of a Polish educational system and it reflects the characteristics of this system. The current context for teacher education in Poland is the result of a radical reform process, driven by repeated state intervention.

The concurrent model of teacher training is a dominating model of teacher training in Poland. It applies mainly to training in pedagogical institutions including teacher training (pedagogical) academies, teacher training colleges, foreign language teacher training colleges, but it also occurs in all Higher Education Institutions. In the framework of each study area the students have a choice of teacher specialization, which means that they can acquire their teaching qualifications during studies, in parallel to their subject related training. For those who graduate with no teaching specialization and later decide to undertake the teaching profession, it is possible to acquire teaching qualifications during postgraduate studies or during in-service training. This constitutes an element of the consecutive teacher training model.

In Poland teacher education for prospective teachers takes place at the different higher educational institutions and it is organized:

- in different forms of education, which can have the form of one-specialisation or two-specialisation studies and five-year unified graduate studies: the graduates are awarded the master’s degree or five-year two-stage graduate studies consisting of three-year undergraduate studies followed by two-year graduate studies: after the former the graduate is granted the “licencjat” degree, while the latter end with the master’s degree, and
- different systems of education, which may be stationary, extramural or evening ones.

Initial training of teachers for the different levels and types of schools is provided within two sectors of education: the higher education sector and the school education sector. The following types of higher education programmes providing training to future teachers function within the higher education sector:

- First cycle studies (Bachelor Degree or equivalent)
- Second cycle studies (Master’s Degree)
- Uniform Master’s degree studies

The above mentioned studies are offered within university type HEIs (those having rights to confer the academic degree of doctor) namely in universities, technical universities, polytechnics and academies, and in non-university HEIs (with no rights to confer the academic degree of doctor). These HEIs function in both public and non-public higher education sector. Those functioning within the school education sector are teacher training colleges and foreign language teacher training colleges (further on referred to as colleges, for the purpose of international comparison classified at the ISCED level 5B). At present, teachers who hold a higher education diploma, including mainly the holders of the Master’s degree, account for ca 27% of those employed in pre-schools, 70% in primary schools and 96% in general upper secondary schools.

In-service teacher training is not obligatory in the Polish education system, however, it is indispensable for the teachers’ professional promotion. In-service training is provided within
two paths: as complementary education and as staff development. Complementary education covers the courses of study which lead to a higher level of education or additional qualifications, and staff development covers the forms of refreshment, which enrich the working techniques of teachers within the qualifications they already have. The financing of complementary education and staff development is guaranteed in the Teachers’ Charter, which provides that the state budget allocates for this purpose an amount equal to 2.5% of the planned expenditure on teachers’ salaries. These amounts can be increased through additional allocations by local authorities, donations and sponsoring.

Complementary education courses are provided by higher education institutions and colleges as evening or extramural studies. Teachers choose the field of study or specialization depending on the level of education already achieved and their individual needs. Since fees are charged for evening and extramural studies, a scheme has been established under which the teachers following such studies receive co-financing to the tuition fee. Each school education superintendent has a certain amount of funds available for this purpose and, respecting the relevant priorities defined in the institution's rules, grants, on the basis of a special committee’s decisions, tuition fee co-financing to the teachers who apply for it. The top priority is to enable teachers to acquire higher-level education and/or additional qualifications within specializations where a given region has a shortage of teachers.

Training under staff development is provided by higher education institutions within post-graduate studies and teacher training colleges, which offer relevant courses, but the main providers of this type of in-service training are in-service teacher training establishments. Higher education institutions provide complementary education and staff development courses independently, within their autonomy.

The National In-Service Teacher Training Centre, called Centre of Education Development (Ośrodek Rozwoju Edukacji), functioning within the school education sector, supports reforms in teacher professional development and provides special conferences, meetings and staff development courses for the whole country, often together with foreign institutions or within the framework of international educational programmes. The Regional Centres of Teaching Methodology, run by the respective regional self-government authorities, provide staff development courses and, though on a limited scale, complementary education courses within specialisations which are in short supply in a given region.

2.3 Challenges of Teacher Education

Preparation of teachers for their profession does not belong to the hot topics of educational policy in Poland. From time to time this problem emerges in the context of either political changes (accession to the EU) or educational reforms or limited, though spectacular, negative events at schools which are widely publicized by media. Then our authorities and educational institutions educating teachers undertake initiatives which make it possible to improve professional skills in a very limited scope. The occasional nature of these debates does not mean that Polish system of educating teachers does not need fundamental organizational and curricular reconstructions. Many of its flaws, beginning with the rules of selection for this profession, are indicated by teachers at higher education institutions educating teachers, educational authorities and future teachers themselves.

Those changes in the field of teachers’ education that undertake the issues of quality,
especially in the process of preparing teachers for work in their profession, require some
longer consideration over possible answers to a few “always alive” challenges, which may be
presented in the form of the following questions:

- Where should teachers be educated?
- Who should educate teachers?
- What should be the content of such education?

2.3.1. Where should teachers be educated?

The findings of the research (Wiłkomirska, 2005) show that the participants of the study
(exerts on education and teachers’ employees) most often talk about these alternative:
university education vs more practical professional education (e.g. at colleges) and teaching
subject matters vs teaching teachers' skills. Today, future teachers can obtain required
qualifications at universities, polytechnics, pedagogical academies, physical education
academies, agricultural academies, professional institutions of higher education and colleges.
Educating teachers in many various institutions has some advantages, e.g. better situation of
graduates who are prepared for two professions on a job market. However, it also has
disadvantages: most often inadequate quality of education and lack of connection with the
needs of a job market. What is interesting, most experts and school principals, as it is shown
by various studies, decisively favours concentrating teachers' education on universities due to
relatively high quality of education. It is worth reminding here about such European trends as
lengthening the time of education to 4-5 years and increasing its status to a university degree.

Determining what higher education institutions should be permitted to educate teachers has to
some extent impact on decisions about such aforementioned factors as recruitment and
selection. In Poland, we do not possess any centralized forms of limiting access to any kind of
higher education. One exception are medical studies. Such open access is inevitably beneficial
to all wanting to learn as long as possible.

Future teachers are recruited mainly on the basis of the educational achievements on matura
examination (final exam, entitling pupils for admission to higher education). In practice, it
means that they are recruited without any introductory conditions, which increases the danger
and size of negative selection for teaching profession.

2.3.2. Who should educate teachers?

Another dilemma concerns the issue: “Who should educate teachers in Poland?” Such an
issue needs an attempt to look first at who and what teachers in Poland are and what their
status is. In Poland, according to the different institutions of teacher education, we can
distinguish teacher educators, who are:
- Academic teachers (faculty members in such higher education institutions as
  for example universities and pedagogical academies; academies of physical
  education; technical universities; academies of fine arts and academies of
  music; teacher training colleges foreign language teacher training colleges) for
  student teachers, who are responsible for teacher preparation and provide
  course work and conduct research as professional studies, some of them are
  student teachers supervisors;
- School teachers who empower and support student teachers in their practices
  of classroom teaching and other aspects of their professional work. They
provide instruction or supervision of clinical experiences of the prospective teachers. They are student teachers advisors;

- Staff from different agencies who design, implement, evaluate professional study for teachers and provide in-service teacher training (e.g., staff from regional centers of teachers professional development)

Most new teacher educators, who work at higher educational institutions, enter them without doctoral level qualifications, or other sustained experience of research and publication processes. Teacher educators are not necessarily required to have practical experience of teaching or to hold a school teaching qualifications. According to the Act of 27 July 2005 “Law on Higher Education”, on entry to higher education new teacher educators must have at least a Master’s degree in a subject or in educational studies. Usually these teachers educators have gone straight from university to being a teacher in higher education. These teachers are a majority. A further type of teacher educators consist of those who were previously experienced teachers in primary and lower and upper secondary education. Before moving into higher education this group has often completed PhD. These teacher educators form a minority of teachers at all teacher education institutes in Poland.

There are no explicitly stated national professional standards for teacher educators in Poland. According to the Act of 27 July 2005 “Law on Higher Education” all teacher educators who are academic teachers are obliged to upgrade his/her professional qualifications. Article 134 of this act ensures academic teachers’ right to research leave. The appointed academic teacher can receive, once every seven years, a paid research leave up to one year’s duration. An academic teacher working on the habilitation thesis can receive a research leave up to 6 months duration. Moreover, he/she can, upon rector’s consent, receive unpaid leave for research purposes. All these regulations apply to those teacher educators who are academic teachers. It means that those teacher educators who are academic teachers they have to take care of their professional development and they can expect support from experienced academic teachers holding the academic title of professor or an academic degree of doktor habilitowany (habilitated doctor) as these teachers are obliged to participate in development and training of research staff.

The higher education institution in which the academic teacher is employed on the basis of appointment constitutes his/her prime place of employment. Academic teachers normally have close links with their home institution, but many of them undertake additional employment in other higher education institutions or outside the education sector (as experts, consultants, specialists, etc.) - they are obliged to inform the rector of such activity. The phenomenon of additional employment was largely influenced by the development of the non-public higher education sector after 1990, with the non-public schools becoming an extremely absorptive labour market and simultaneously offering in many cases much higher salaries than those in public schools. Ex-officio transfers of academic teachers to another higher education institution are not a common practice as higher education institutions enjoy very extensive autonomy and freedom with respect to employment. A teacher may change his/her job on the basis of an agreement between the parties involved or hand in his/her notice in one school and undertake employment in another one, while respecting the provisions defined by law (e.g. leaving at the end of an academic year and at three months’ notice).

Teaching in teacher education is seen as a complex task, involving a wide range of pedagogical knowledge, skills and understanding. Teacher educators’ work on pre-service courses generally includes: teaching students in higher education institutions; supervising
students on school placements; engaging in research; service to the school sector; and service to higher education institutions. In addition to teacher educators’ teaching and service roles, teachers educators, especially those who work at universities, are required to be research active and publishing their work in accepted academic formats. So, in many ways teacher educators’ work is similar to that of other academic staff in that they teach and research, including publishing papers and books and presenting at conferences. As the above accounts show, in Poland the ways of understanding teacher educators’ work are closer to the conventional academic model of teaching, research and service to the university. Most Polish teachers' educators centre their work around their teaching and researching roles.

The general expectations are that most teacher educators will facilitate the learning of student teachers through reflective practice as a model of the good practitioner. Discourses of reflective practice are central to the ways in which teacher education and working in schools are understood. However, the existing conditions in which teachers’ education takes place in Poland (especially great numbers of pedagogical students in higher education) result in such situations as:

- reduction of face-to-face contacts between students and teachers;
- domination of subject knowledge and necessity to obtain competences over learning from experiences and biographical or social learning;
- superficial of fictitious decisions on curricula - “technology of agreement”

These kinds of trends may reduce learning in teachers’ education organized within higher education institutions and lead to domination of “transmission-qualification” learning over “biographical-context” learning.

2.3.3. What should be the content of teacher education?

In Poland, the higher education institution's autonomy is restricted by to legal regulations: the directive of the Minister of National Education and Sport of 7 September 2004 on standards of teacher's education (Dz.U. Nr 207. poz. 2110) and the directive of the Minister of National Education of 12 March 2009 on particular qualifications required from teachers and determining certain schools and cases in which teachers without higher education degree or graduation from teachers' education institutions can be employed (Dz. U. z 2009 r. Nr 50. poz. 400). The former one determines thematic groups of education, minimum numbers of teaching hours, general content of education and quite imprecisely “the personal profile of a teacher”. The latter one indicates the qualifications that teachers working in particular types of schools should have. In teacher's education – according to the standards of education – the emphasis should be placed on practical skills and an academic and scientific basis and provide teachers with the competence and confidence to be reflective practitioners and discerning in managing information and knowledge. Teaching profession should be placed within the context of lifelong learning. Therefore, teachers’ professional development should continue throughout their careers. Teachers need to be committed to the process of lifelong learning. These principles of education policy ensure the status of the teaching profession and recognise the role of teachers as key factors in educational change. Apart from the subject related and pedagogical training (psychology, pedagogy and teaching techniques) – the teacher has to learn how to use ICT in teaching and acquire good command of at least one foreign language. These new skills have been considered to be indispensable in working with a pupil in a modern school.
The research shows (Wiłkomirska, 2005) that there is a number of necessary changes which ought to be introduced into the teachers' education curricula. Polish higher education is not varied enough and only a little competitive as far as educational offer is concerned. To a large extent, it results from the restrictions imposed in the field of methodology through defining educational standards for each specialization.

As far as curricular content is concerned, various studies show that subject education must be stronger combined with methodological education, practice at school, basic curricular content and examination standards. The researched support introduction of education in a few related subjects and giving students some knowledge about methods of integrating subjects. They understand that such changes would mean extending curriculum and increasing the number of classes. As far as psycho-pedagogical education is concerned the researched wish to have classes assisting in coping with behavioural issues. In order to tackle these issues one needs to be able to recognize emotional problems and know how to reduce tension causing behavioural disorders. Students must be closer to school and participate in its life.

3. Conclusions and Proposals

The changes proposed by the Polish government are to contribute to creating better conditions for functioning of institutions of higher education through improving the effectiveness of public money spending on higher education in Poland. These changes are primarily – as it is assumed by educational policy-makers and creators of these changes – pro-qualitative in nature.

Thus the financing of higher education is to be first of all connected with promoting the best organizational units within institutions of higher education and the best students and doctoral students in such a way as to stimulate competition among them concerning level of scientific research, of methodology and studying. Many reforms proposed by the government aimed at reinforcing educational quality seem justified in view of present reality and can lead to positive changes approved of by the society. In the area of teachers’ education these changes should be expressed in the form of:

- **appropriate selection of staff which educate teachers** through creating effective conditions for the elimination of pathological employment of university and college teachers on many positions (the governments premises for changes include stricter procedural rules for employing on many positions).
- **mastering curricula for teachers' education** through introducing the National Qualification Framework into practice. This framework may assist in weakening the restrictions on curricula connected with standards of teachers' education. The education assessment will be moved – as it is shown in the government's proposals for higher education – from processes to educational results.

The analysis of teachers' education in Poland contrasted with other European solutions shows that it is worth – in addition to benefits brought about by changes introduced by educational authorities – considering a few solutions which has not been used in Poland yet.

1. **Limiting** number of students/candidates for teachers in institutions of higher education depending on the demand for teachers and simultaneous significant increase of funds for education (introducing independent financing line). The ministry of Education would sign contracts with institutions of higher educations offering particular
teachers’ education curricula (a kind of licence for educating teachers). Universities and colleges would declare their annual recruitment limits. Non-governmental agency would probably be better, but we do not have such ones in Poland and then we would certainly have to introduce new significant legal regulations. Both these solutions require prospective policy of employing teachers, constant monitoring of needs and flexible responding to the threat of teacher deficit.

2. **Selection** within an institution of higher education not only at the level of an entrance exams, but also in relation to a choice of teachers’ education. Universities and colleges should take into account student's academic achievements prior to the recruitment process so that only the best can have a chance to become teachers. A smaller number of students should be provided with very good preparation for work at school through expanding educational offer by contents lacking nowadays.

3. **Increasing the level of qualification requirements.** Following the example of most European countries, the requirement for teachers of obtaining Master's Degree to be able to teach at the lower secondary level and higher. Then this requirement should be gradually expanded among primary school teachers.

To conclude, I would like to emphasise that the portrayal of Polish education in the context of Polish educational reality and proposed government's changes in higher education indicates that the notion of *quality* is one of key ideas for debating on teachers’ education in Poland. It is worth looking at the latest proposals of the Polish Government concerning the improvement of the quality of higher education and mentioning that the strategy of higher education development in Poland – as expressed in the documents devoted to changes in higher education – is verbalized in the language of economy, theory of organization and theory of effectiveness. The reforms are presented as giving higher educational institutions ‘greater freedom in operational decisions and remove unnecessary constraints in financial and human resource management. However, crucially it is to see these reform processes as processes of re-regulation: not the abandonment by the State of its controls but the establishment of a new form of control. In this way, the state also provides a new general mode of less visible regulation, a much more ‘hands-off’, self-regulating regulation (Ball, 2003, p. 217). Recognizing the degree of “competitiveness” in higher education as the most important indicator of “quality” shows beyond any doubt that the quality of higher education will be achieved by promoting competition instead cooperation in this area and will be directed at assessing the effects of education.

However, educational literature shows that when educational quality is concerned, not only final effects should be taken into account, but also the quality of processes in developing, implementing and improving institutional activities. It is often the case that when speaking of teacher education and its quality, it is easy to revert back to such managerial concepts as quality control, quality mechanisms, quality management, etc. These concepts convey a technocratic and top-down approach in the development of "quality assurance movement" in higher education. I assume that a focus on quality in teacher education should on the one hand always enhance and improve the current status and develop the systems that assure it, and on the other hand perceive the concept of quality of teacher education as an ongoing exercise (Michalak, 2010). It is not a state that is reached once and for all but one that needs to be pursued continuously. Therefore, we should rather focus our considerations on the process of creating the quality culture at teacher education, not only on the outputs.
Focusing attention on the process of building up the culture directed at achieving desirable quality of teachers' education shows that any cultural change requires engagement and ownership by all levels of staff within the teacher education institutions. When the student perspective is made central to the definition of quality it makes sense to use front line staff – teacher educators to be the architects of a quality culture. The teacher educators have the most frequent contact with the students. They engage on a personal level and obtain information that cannot be gained from impersonal surveys about the quality. They have intimate knowledge of what is required to meet and exceed students’ expectations. Improving quality should be perceived as a way of teaching prospective teachers and teachers.

It is an interesting fact that so little space in educational literature and documents concerning educational policy (Snoeck & Žogla, 2009; Snoek, Swennen & van der Klink, 2010) is devoted to conditions conducive to becoming a university teacher/teacher educator. This situation seems disturbing especially in relation to the role ascribed to academic teachers in shaping desirable practices in the area of higher education that translate themselves into creating high quality education in lower level schooling. In view of inadequate number of research projects on inclusion into the profession of teacher educator and on their constant professional development, there exists an urgent need to pay adequate attention to the profession of teacher educator and teacher educators themselves. Therefore it is necessary to undertake research on the quality of teachers' education and professional development of teacher educators. In view of the challenges that higher education is facing nowadays, the questions about how much teacher educators are engaged in their own professional development and in what way their process of becoming teacher educators is shaped arise. What speeds up and what slows down the course of this process? How do teacher educators cope with university everyday life which forces them to constantly balance between the traditional academic sacred and the contemporary profane posing a series of economic challenges. How do they cope with the antinomy between the mass reach of education (mass, anonymous audience), and the sense of the need to notice and take into account a personal, individual entity of a student/future teacher? What problems feed personal pedeutological reflection of teacher educators?

References


Facilitation and hindrance of change: Characteristics of collaboration in teacher education in a large-scale university

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Leadership in teacher education is a complicated task because of the diversity of competencies and the number of departments in a university that should collaborate for attaining set targets. It seems to be a common practice that various teacher training curricula and related educational research are situated in different faculties of a university. They all have different traditions and also different outcomes or expectations in this field. In this paper, we discuss three different cases applied by Pedagogicum of the University of Tartu in developing teacher education. Pedagogicum is a new institution that should, in line with the national strategy of teacher education, facilitate improvement of the quality of teacher education and educational research in related fields. A key strategy for achieving these aims is promoting collaboration at the university and with outside partners. Therefore, transformational leadership has been applied in the context of a matrix management system.

In this paper, we describe our three cases in initiating changes in teacher education. These cases are about accreditation of prior and experiential learning, development of pedagogical practice, and composing an application for a doctoral school. Exploration of these cases gives a possibility to rise three recommendations: the work for a task that could cause a conflict with existing regulations or traditions should be planned more carefully than in generating something new; timelines and deadlines of particular tasks could be followed better if the initiators and core group members belong to a group of higher academic and management level, or at least have a close cooperation with them; the core group of a task should have an effective size so that every member sees importance of his or her role and can actively contribute to the work.

Keywords: educational leadership, change management, teacher education, case study
Introduction

In the current paper, we discuss the importance of selecting appropriate leadership strategy in the context of a matrix management system applied at the University of Tartu for achieving the changes expected by the Ministry of Education and Research. The matrix management system could work in a complex system of departments in a university as it is also a common case in teacher education and related educational research.

At the beginning of 2009, the Estonian Ministry of Education and Research approved a new strategy for teacher education to be effective from 2009 to 2013. A number of targets in this document should be achieved through extensive work of universities where teacher education programs are situated. Therefore, universities should take it into account when developing their financial agendas, strategic plans, and taking actions on motivating teacher educators towards the targets. It is also important to find a way for showing that a document developed by the ministry, even if in collaboration with universities, has a value to the related institutions and the personal professional career of their employees. These questions are especially interesting in the field of teacher education as it is an area where the variety of competences, experiences, traditions, attitudes, and beliefs of specialists with different background should work in collaboration for achieving expected outcomes. It means that the variety of people with their background in social sciences, humanities, science, and arts should find coherence in teacher education.

Among six courses of action, the Estonian Strategy for Teacher Education (Eesti õpetajahariduse strateegia..., 2009) points out leadership in teacher education as one important issue. It is stated in the strategy that it should be research based, continuous, and coherent with the developments of the general educational system. We see this as a key issue that could lead either to success or failure in attaining all other targets of the strategy. We hypothesize here that among eight main types of leadership theories (see Burns, 1978; Cherry, 2010) the transformational leadership theories would work best in an institution of higher education where a number of highly qualified specialists from different departments with overlapping competencies work together on the same topics. Different transformational leadership theories focus on the connections between the actors in the processes. The role of the leaders is to motivate and inspire people by helping group members in seeing the importance and benefits of the task. According to this cluster of theories, a leader should focus on the performance of group members, but also on encouraging each person to fulfill his or her potential. The other types of theories could be too straightforward in a community of professors and other colleagues who are in many cases also leaders in their department or in various professional communities.

In line with this general approach to leadership the matrix management (Galbraith, 1971) can be seen as an appropriate type of organizational management of large-scale teacher education institutions. It gives a possibility to invite people from different faculties to work on a general task. This means that the leader can invite experts based on a particular issue. In an ideal case, a dynamic group of teacher educators and/or scientists will be formed for applying their competences in solving a problem – making it possible to use the overall available human resource at a university. However, there are also some disadvantages that could lead to unsuccessfulness. Firstly, in many cases loyalty could be a problem. Employees should follow tasks of their main employer and the leader of a new task should motivate them to work on a supplementary task. Secondly, it is difficult to monitor the work of a group because of employees’ independency which could result in delays of outcomes. Thirdly, general projects also need management resulting in an increase of costs. However, if these problems can be avoided then the matrix management with transformational leadership could be a successful combination for managing changes in teacher education at the level of universities.

Context of the study

This study focuses on teacher education co-ordination at the University of Tartu in Estonia. The University of Tartu is the largest university in Estonia. It has 9 faculties and 5 colleges with around 3,000 employees and 17,000 students. The Faculty of Education filled the role of initiator and leader in the field of teacher education at the University of Tartu from 2000 to 2009. This faculty was established on the basis of a number of smaller departments or research groups from different faculties; however, many other teacher education departments and research groups were continuing their work in other faculties. Eventually, it was found that it was difficult to
develop and impose general guidelines and rules or represent all other departments by one faculty among the others. The faculties are institutionally at the same level and if teacher educators and researchers in these share the same competence then it could result in competition, not collaboration. Thus, the University of Tartu decided to establish Pedagogicum of the University of Tartu as an institute that is legally independent from the faculties and colleges but should work for them according to the decisions made by the council formed from the representatives of the faculties and colleges. In 2010, the former Faculty of Education and Faculty of Social Sciences joined to form the Faculty of Social Sciences and Education.

Currently at the University of Tartu, teacher education and related research is one of the activities in six faculties and two colleges, which are co-operating in the work of Pedagogicum. All these institutions have different backgrounds and traditions in educating teachers. Given the large variety of practices, it is a challenge to apply a general strategy of teacher education at the university level. The general aim of Pedagogicum is to facilitate improvement of the quality of teacher education and educational research in related fields. A key strategy for achieving these aims is promoting collaboration at the university and with outside partners. Consequently, Pedagogicum has a complicated position as both a messenger and facilitator in introducing changes. Moreover, Pedagogicum should also get some of the finances from a budget that was formerly the budget of other faculties.

As will become evident, the current case of the University of Tartu represents a case of teacher education in a large-scale university. However, teacher education curricula are not always applied in large-scale universities. In Estonia the situation could be compared with Tallinn University. Other universities in Estonia are smaller and concentrate on educating only a specific group of teachers. At the University of Tartu, nearly all the different types of teachers needed in Estonian schools are educated. Thus, our cases and following discussions apply only for large universities where there is no single department where all teacher education curricula are situated.

**Methods**

In the current study we analysed three cases of the work of Pedagogicum of the University of Tartu. In all the cases Pedagogicum was the initiator of the activities and one of the employees of Pedagogicum applied a transformational leadership strategy in the context of a matrix management system. The cases were selected due to the variety in outcomes and efficacy, as well as in the characteristics that could have an effect on the case. Each case was analysed according to the following plan:

1. **Goals and objectives of an activity** – why this activity was started and what outcomes were expected.
2. **Case group** – people and institutions involved in performing this activity: sub-groups of the groups (initiators, core group, applicant group, target group); their availability, motivation, commitment, skills, and attitudes; institutional interests.
3. **Process** – timeline (if the deadlines were ambiguous or clear; realistic or non-realistic timeline), work methods, important internal and external factors (including co-operation with other universities).
4. **Resources** – finances (additional budget or re-allocation of an existent budget), workload needed from different group members, availability of materials for work.
5. **Results** – general description of outcomes, evaluation of the efficacy of the procedure and quality of the outcomes.
6. **Reflection** – what we have learned from the case.

The data analysis consisted of the following steps. Firstly, initiators involved in the cases composed thick descriptions of the cases (Geertz, 1973). Secondly, the descriptions were analysed by one person to find similarities and differences between the cases. Finally, a group discussion with all the initiators was held to deliberate the findings.
Description of the cases

Case 1: Accreditation of prior and experiential learning

Goals and objectives. The main goal of this case was to analyse current practice in accreditation of prior and experiential learning (APEL) in teacher education and to develop general principles and criteria for applying APEL in teacher training at the University of Tartu. APEL is an important topic in the Estonian Strategy for Teacher Education as the models for teacher education should be flexible and taking into consideration the individuality of learners. The general guidelines for APEL could replace the variety of traditions and pre-defined assessment criteria applied in different faculties and colleges and, therefore, assure equal treatment of students in all institutions within a university.

Several smaller objectives had to be completed to reach this general goal. These included document analysis, analysis and sharing of best practices, e-mail correspondence, and series of meetings with a core group formed for completing the task.

Group. All activities at the University of Tartu were co-ordinated by one initiator from Pedagogicum – a senior specialist in teacher education. Activities were carried out by the core group consisting of the initiator, and 12 representatives from all faculties and colleges providing teacher study programmes. Members of the core group were also responsible for the dissemination of the discussions and finding agreements inside faculties and colleges.

Compiling the core group was a complicated task – an attempt was made to involve at least one person among the best practitioners from the APEL committees of all faculties and colleges. The inclusion of members had to be agreed with every member, the deans of the faculties or directors of the colleges, and with the director of Pedagogicum. The group was formed on the basis of the most competent lecturers, program leaders and other staff but, as a result, most members of this workgroup were very busy and had other duties in teaching and research. In addition, problems appeared in following the initial set timeline. It was challenging to find available times for workgroup meetings, for completing tasks, and for compiling or analysing documents.

Motivation, commitment, skills, and attitudes of members of the core group were different. Most members participated in discussions and analyses very actively, completed all tasks on time, and answered posed questions quickly and on time. However, some members of the group had problems finding time for analyses and for participating in group meetings. None of the members ignored the process; however, if somebody missed one or two meetings then there was a need to keep some discussions going in different meetings and this slowed down the whole process.

Some problems with task completion originated from institutional interests – even if a member of the core group agreed, after discussions, to a common understanding; afterwards, it was hard to disseminate the agreement at his or her home institution. An additional demotivating factor visible in the group was resistance – some members were not interested in changes at all or reflected their home institutions’ resistance.

The applicant group consisted of other members of the APEL committees of the faculties and colleges and other teaching staff. The applicant group received information about the major developments and discussions throughout the process from members of the core group and there was one special seminar for dissemination and discussions. The target group of this case contains all students but also student candidates of teacher education programmes if they have prior learning or work experience concerning their studies – mostly working teachers who attend to teacher education programmes.

Process. This case has progressed five months and will continue in autumn 2010. Preparation started in September 2009 with planning the process, negotiations about the need of the work, and finding resources. The main process started in January 2010 with the compilation of the core group and the agreement of the timeline. The initial deadline for the task was May 15, 2010. In January this deadline seemed realistic while we had information that assessment criteria for all study programmes should be finished by 1st of April. This deadline originated from state regulations set by the Ministry of Education and Research, which prescribed a deadline for
Estonian universities to apply pre-defined assessment criteria of learning outcomes in higher education curricula from September 2010.

During the process of working out assessment criteria for learning outcomes for all study programmes at the University of Tartu problems appeared as a result of an unrealistic timeline; tasks were tightly bounded with this process. As this process was not completed at the end of May, we were not able to meet set targets in the agreed timeline. As a result, it was decided to continue the work in autumn 2010 after finalising the assessment criteria of the study programs.

Resources. There was a small budget for meetings and seminars of the workgroup and allowances for additional work. It was an additional budget for the regular budget of the university. The workload of the core group was generally reasonable; there were smaller problems with some members, who could not attend all meetings – restarting already finished discussions sometimes de-motivated other members.

Results. Currently there are developed draft outcomes of the work: (1) the analysis of the current situation of APEL, (2) proposal for some changes in university level regulations; and (3) a draft of common principles for APEL in teacher education. All results will be finished on autumn 2010. Efficacy of the process was normal, members of the core group were satisfied with the process and outcomes, their awareness raised, and sharing of best practice was important for them.

Reflection. While looking back at the above described activities, it must be pointed out that Pedagogicum managed to coordinate the workgroup and discussions on common principles but only after finalising this work is it possible to determine its success.

The most problematic issue was the commitment of some members of the core group and their willingness and responsibility to actively participate in the process. The challenge is how to promote core group members to have an active attitude and willingness to take responsibility for disseminating discussions and outcomes in their faculty.

Another lesson learned is related to the timeline – more respectively with all timelines in organising university study process; this time the process was too early and it is hard to work parallel with new developments, even if they are closely connected.

Case 2: Development of pedagogical practice

Goals and objectives. The goal of the workgroup was to analyse different practices of all faculties and colleges of the University of Tartu in organizing pedagogical practice in schools and kindergartens and, on the basis of this, to develop a coherent set of documents guiding pedagogical practice all over the university. Pedagogicum was responsible for the results of the workgroup.

Case group. The initiator of the workgroup was an employee of Pedagogicum – a senior specialist in teacher education. The core group was formed from 21 members who belonged to the teaching staff of different faculties and colleges. They were also experienced supervisors of pedagogical practice. The workgroup also included one representative from a partner school, one from kindergartens, and one from teacher training students. The role of the initiator as the leader of the group was to motivate workgroup members who had to implement the results.

The applicant group consisted of medium level academic and management staff of 6 faculties and 2 colleges and teachers of partner schools; mainly without a PhD degree. Responsibility for organizing the pedagogical practice is at the faculty which co-ordinate these curricula. In the case of every curriculum there is also a program board which defines purposes of the practice and how to arrange them. Implementers of the guidelines and regulations of pedagogical practice are mainly supervisors of practice. The target group consists of all baccalaureate and master students in teacher education and supervising teachers of partner schools. An important characteristic of the core groups is that they also involve employees outside the university.

Process. The guidelines of pedagogical practice were developed within the University of Tartu. The workgroup had regular meetings and communication by e-mail. One input for the group was the yearly feedback collected by group members in different faculties and colleges. Every year feedback is asked from trainees and supervisors from the university, as well as from schools and kindergartens.
The work for improving pedagogical practice started in 2009. In June and August of that year the leader of the workgroup met individually with the principals or vice principals of the schools and kindergartens in which the practice is held. The aim of this activity was to clarify their expectations for the university. In September and October, individual discussions with supervising teaching staff at the university were held in order to have an overview of circumstances in different faculties, and to hear their proposals for organizing and conducting the practice. Meetings were also held with trainee supervisors in schools and kindergartens.

In January of 2010, a pedagogical practice workgroup was established. Different interest groups were involved in the area of pedagogical practice and; therefore, the discussions took a lot of time and the timeline was shifted several times.

The core group of this task had several meetings without progress given that members of the group represented their personal interests, experiences, traditions in conducting pedagogical practice, and attitude of their structural unit. There was a willingness to homogenize the principles of pedagogical practice at the university but the majority of the group was not consent to waive their old traditions and principles. Consensus in some principles of how to organize pedagogical practice was reached from January to April 2010. From that point on the cooperation between the members of the workgroup has been fluent and fruitful.

At the beginning of the work of the core group, the team leader’s opinion was that general principles of conducting the teaching practice and regulations related to this would be completed by the beginning of academic year 2009/2010. In effect, they were ratified only at the beginning of teaching practice in 2010. The members of the workgroup were convinced at the starting point that the topic was very important and attending to it would take a lot of time.

During the development of the practice we tried to collaborate with other universities in Estonia and consider the experiences of universities outside of Estonia.

**Resources.** There was a small budget for meetings and seminars of the workgroup and allowances for additional work. It was an additional budget for the regular budget of the university. Most of the work hours and salary was planned for leading the workgroup. Other workgroup members keep day-jobs. Therefore, they had difficulties in finding time for the work in the workgroup. The process is largely influenced by financial means meant for conducting the pedagogical practice.

**Results.** The work of the pedagogical practice workgroup resulted in draft regulations for organizing teaching practice in all faculties and colleges. The group was working towards a general regulation, the procedural guidelines for conducting practice, frame-agreements, and templates for contracts with practice supervisors in schools and kindergartens. The principles for co-ordinating and conducting pedagogical practice have almost been homogenized. Different faculties and colleges communicate to each other more often. They share experiences and good ideas to conduct the practice.

**Reflection.** The work on improving the pedagogical practice at the University of Tartu has demonstrated that it is always reasonable to gather the knowledge of outstanding experts and plan further development and actions regarding it. Every distinguished expert has a very strong personality adherent to one’s principles and will not come along with changes quickly. The leader of such working group must manage the workgroup’s work with wisdom and stoutness in order to reach the goals set. He or she must be able to piece together a realistic timeline. It is very important to share information, support, and help in every way the parties involved in organizing practice, especially during the time of introducing changing.

**Case 3: Application for the doctoral school**

**Goals and objectives.** The main goal of this course of action was to prepare an application for a doctoral school of education in Estonia that would meet the needs of PhD students, their supervisors, and other parties involved in doctoral studies and would be judged as a successful application by the financing authority of the doctoral schools. To reach this goal, several smaller objectives had to be researched. These included, document analysis, e-mail correspondence and series of meetings with prominent educators and specialists to chart out the current situation of doctoral studies in education, to negotiate the vision of desired situation, and to plan concrete activities necessary for improving doctoral studies in education in Estonia.
Group. This doctoral school was prepared by two universities – the University of Tartu and Tallinn University. Below, we describe the groups of people who were involved in Tartu. All activities at the University of Tartu were coordinated by two initiators from Pedagogicum – a senior researcher and the director. Activities were carried out by the core group consisting of the two initiators, four professors (two professors from the Faculty of Education and two professors from the Faculty of Natural Sciences and Technology) and the dean of the Faculty of Education. The fact that activities were initiated by Pedagogicum provided a neutral ground for two faculties which educate doctoral students in education and possibly eliminated some tensions that could have risen in case the initiator would have been either one of the faculties. All members of the core group were committed and motivated to work on the application owing that a successful application would result in direct benefits for their institute, staff and PhD students. Respectively, the core group members took part in regular meetings and replied in short notice to e-mails. The applicant group and the target group consisted respectively of supervisors and PhD students whose research was closely related to the field of education from six faculties at the university. The applicant group received information about the major developments throughout the process.

Process. The process of application preparation lasted 11 months. The initial application for a doctoral school was prepared in three months. Clear and realistic deadlines regulated the application process. Initially, the core group worked as a team that was lead by the director of Pedagogicum. The major role of the professors and the dean was to provide input and critical feedback on the materials that were prepared by the initiators. However, besides the staff of the University of Tartu, an important external party was involved in the process. The application of the doctoral school was prepared in collaboration with colleagues from Tallinn University. This factor influenced the pace and methods of work. Although it was agreed from the start that all resources would be equally divided between the two parties, both universities wanted to be the major applicants. Negotiation between the vice rectors and rectors of the two universities resulted in the decision that the major applicant would be Tallinn University. After this decision, the Tallinn team became the initiating party. Working in a bigger team also resulted in a decline of effectiveness of actions. Overall, communication became slower within a bigger team and some important information was lost or delayed. For example, although team members gave feedback on prepared documents, changes were not made or were made with a delay to the document. Nevertheless, the application was conditionally accepted and the autumn months were spent on making adjustments to the application. Similarly as before, although both teams showed interest in preparing a doctoral school, the (e-mail) communication within a big team was at times considerably delayed. Regarding the work load of the Tartu team, it can be said that besides the initiators, a professor, who agreed to become the head of Tartu division of the doctoral school, was investing more time than other members in this phase. E-mail forum and individual discussions were the major working method applied at this period. Finally, it can be said that although working in the extended group brought along some elements of de-motivation, overall, the core groups and individual discussions were the major working method applied at this period.

Resources. Successful application meant additional finances for developing doctoral education in the field and compensation for the work carried out during the preparatory phase of composing the application. Workload of the core team was generally reasonable; however some ineffective activities caused additional workload for the two initiators and a professor who was to become the head of doctoral school in Tartu. All core team members received allowance for their work in the preparatory phase of the doctoral school.

Results. The fact that the application was approved and the doctoral school of education was established would suggest a positive evaluation of the processes. However, it must be said that the process also included several ineffective elements. First, the decision about the major applicant should have been made earlier in the process. Currently, both universities worked on their own application in the first place and it was a political decision, made by vice rectors and rectors, that gave the role of major applicant to the Tallinn team. To some extend for the Tartu team the new situation meant going backwards in the process owing that they had already finalized a draft application. Second, the communication within the extended group was at times a serious issue. Although it was meant to broaden the perspectives and deepen the discussions, it also resulted in loss of focus and resources.

Reflection. While looking back at the above described activities, it must be pointed out that Pedagogicum managed to coordinate the preparation of the doctoral school within University of Tartu by being a neutral partner for two faculties that carry out doctoral studies in education. Important contributing factors were external
finances for the activities and prospective benefits for all parties involved that resulted in interest and commitment in the activities. What this case also shows is the importance and impact of political decisions on the primary process of an institute. Moreover, the picture gets even more complicated when including the important external partner of this case. An external factor or partner can result in an increase of motivation within a team; for example, cause higher commitment due to extended board of expertise involved, but it can also de-motivate a team. Slow and ineffective communication contributes surely to de-motivation. In the current case evidence of both sides was visible.

**Discussion**

The comparison of the three cases used in this study demonstrates that the results were achieved by initial deadlines only in the third case. However, the efficacy could be evaluated differently in all cases. We found that it was the highest in case 3 and the lowest in case 2 (see Table 1). As follows, we are analysing what could be the factors having important influence on achieving attainment targets in applying a matrix management system through transformational leadership. These 3 cases give readers some ideas that can be applied for achieving better results in operationalizing country level and other general strategies in different departments of a university. However, regardless the ideas of the following discussion we have to admit that this study had several limitations. Firstly, we applied a qualitative approach and, therefore, the results are not generalizable. Secondly, the cases are not well comparable because of the variety of many factors. Thirdly, in analysing the differences of the units separately we can just formulate hypotheses that could show some effect on the outcomes but these have to be controlled in the following studies.

**Table 1. Comparison of cases of the study in a meta-level.**

<table>
<thead>
<tr>
<th>Analysis units</th>
<th>Case 1: Accreditation of prior and experiential learning</th>
<th>Case 2: Development of pedagogical practice</th>
<th>Case 3: Application for the doctoral school</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goals and objectives</td>
<td>general guidelines for faculties and colleges</td>
<td>general guidelines for faculties, colleges, and partner schools</td>
<td>activity plan and related budget</td>
</tr>
<tr>
<td>Case group</td>
<td>Initiator</td>
<td>MSc level, non-academic</td>
<td>MSc level, non-academic</td>
</tr>
<tr>
<td>Core and applicant group</td>
<td>medium level academic and management staff of 6 faculties and 2 colleges; mainly without a PhD degree; core group consisted of 13 persons</td>
<td>medium level academic and management staff of 6 faculties and 2 colleges, and teachers of partner schools; mainly without a PhD degree; core group consisted of 21 persons</td>
<td>high level academic and management staff with a PhD degree (mainly two faculties); core group consisted of 7 persons</td>
</tr>
<tr>
<td>Target group</td>
<td>student candidates and all students</td>
<td>baccalaureate and master students, teachers of partner schools</td>
<td>PhD students and their supervisors</td>
</tr>
<tr>
<td>Process</td>
<td>Deadlines postponed due to external factors</td>
<td>Deadlines postponed due to internal factors</td>
<td>Changes in timelines due to external factors but deadlines not postponed</td>
</tr>
<tr>
<td>Resources</td>
<td>Budget for salary (mainly for the initiator) and other costs; additional workload for all members of the core</td>
<td>Budget for salary (mainly for the initiator) and other costs; additional workload for all members of the core</td>
<td>Budget for salary (for the core group depending on workload); additional workload for all members</td>
</tr>
</tbody>
</table>
The comparison of the cases demonstrates that the goal of cases 1 and 2 was to develop general guidelines that should replace or have an effect on the existing ones in different departments. It means that there was a possible conflict between existing and new guidelines. Case 2 was, however, more complicated while the outcome of it had to be applied not only within the university but also in partner schools. It could raise the level of importance and commitment of the core group of the task. Case 3 was in its matter much more motivating and inspiring for the partners while in this case the core group had to develop a new plan for using an additional budget for developing teacher education and research staff through PhD studies. Thus, the nature of the task could be one factor that determines the success of the case.

In comparing the case groups, we could see two general differences. In cases 1 and 2 the initiator was a non-academic person without a PhD degree while case 3 was initiated by academic persons holding PhDs. Secondly, the core group consisted of persons at the highest academic or administrative position while in cases 1 and 2 the members of the core groups did not have so much independence in their decisions. One important difference between cases 1 and 2 was that the core group was much bigger in case 2. It could lead to a more shared responsibility that can cause a lower success in the process. Some effect to the importance of the task could also be caused by the target group. In case 3, the target group is much more personally related to the core and applicant group while many members of the target group are their colleagues or could be in a near future. In the other cases personal contacts after graduation are seldom.

One more important factor in determining the success of a case seems to be the course of the process. In the first two cases the core group did not consist of persons who have to take the final decisions at different departments. This was probably one reason why in these cases the deadlines had postponed. Additional reasons can be seen among other factors. In the first case the shift of deadlines was possibly also caused by external factors while in the second case by internal factors. We can hypothesise that this is one of the most important differences between cases 1 and 2 and a possible reason why the first case was a little more successful. It could be easier to accept changes caused by external factors than in the case of reasons derived from the workgroup.

From the viewpoint of resources these cases were quite similar. However, an important distinction could arise in concurrence of the different characteristics. In cases 1 and 2, the core group did not consist of people who have large-scale possibilities to manage resources in their department while in case 3 many members of the core group had these possibilities and duties. As a result, they could have a different view on the resources available for a particular work and resources that should be re-allocated or could be added in applying the outcomes of the work.

As a result of the comparison of the cases we can make the following three main recommendations for planning analogous work in similar context:

- a task that could cause a conflict with existing regulations or traditions is more complicated than a task for generating something new and, therefore, the work for the first one should be planned with a special care;
- a timeline and deadlines for completing a task could be kept better if the initiators and core group members belong to a group of higher academic and management level or at least have a close co-operation with them;
- the core group should have an effective size so that every member of it sees the importance of his or her role and can actively contribute to the work.
Conclusion

Our first 18 months at Pedagogicum of the University of Tartu have shown that the leadership of teacher educators and educational research fellows of various faculties and colleges is not a simple task. However, it can be completed through building bridges between persons owning different experiences and views about teacher education policy, and supporting collaboration of competing experts. Our cases demonstrated that even in the case of a variety of initiators and tasks the work can be successful in applying transformational leadership in the context of matrix management system. However, the level of success could be different and several ideas have been raised for increasing the efficacy of the work. We hope that we and the readers of the paper can test the recommendations made by us and on the basis of more carefully designed studies it could be possible to verify our hypotheses set in this explorative study.

Acknowledgement

This work has been done on the basis of valuable results collected from the members of the core groups of the cases analyzed in this study. Their help is invaluable. Moreover, the authors also wish to extend a thank you to our closest colleagues at Pedagogicum. Their support at different stages of the work has been very inspiring.

References


The Range of Methods in Estonian Teacher-Training Curricula

The document “Improving the Quality of Teacher Education” (2007) raises the questions about efficiency of general learning and teaching methods – classical lectures versus problem based learning. The document also discusses the topic of using those general methods in teacher-training. It is inevitable that teachers, who are taught using narrow range of methods, will have the poorer baggage of methods to apply in their own work at school.

This paper will discuss the methodological focus of Estonian teacher-training curricula. The paper is based on the fact that it is common practice to fixate topics and methods that will be used in the teaching-learning process in the detailed overviews of the subject-courses. Three teacher-training curricula of one of the Estonian higher education institution were examined in order to find out the range of methods planned in certain teacher-training curricula’s course descriptions. Data was processed with content analysis.

As occurs, the weak point of examined teacher-training curricula is the lack of balance between lectures and academic reading as classical methods; teaching methods that could give a possibility to implement theories in simulated situations; and real practice. There was a lack of variety of methods that were used in the three examined teacher-training curricula. The discussion part of the paper focuses on the reasons behind the current situation and possible solutions.

Introduction

The present paper will discuss the methodological focus of teacher-training curricula at the University of Tartu. The introduction we start with pointing out certain competencies necessary for teachers according to the Professional Standards for Teachers that is the fundamental document for all teacher-training courses and curricula, and we will continue with the overview of the structure of three teacher-training curricula studied. At the end of the introduction there will be pointed out the problem that directed this research.

According to the Professional Standards for Teachers, the teacher’s main obligations are to plan and direct the students’ learning process; to supervise students, support their development and motivation; to critically analyse and evaluate the learning process, give feedback to the
students and their parents; to involve students in planning the content and goals of their studies; to support students in developing their learning and social skills (Õpetaja kutsestandard 2005: 3). These are the social competencies that are not directly related to the academic subject but still have a crucial importance in educational process. This is the framework that has to be kept in mind while preparing future teachers.

Within all teacher-training first level curricula it was decided to study and analyse special teacher-training curricula with compulsory module of pedagogical disciplines. The reason this decision was made is that in Curriculum Development Strategy (2009) it is argued that there is a lack of using the principle of integration: majority of the first level (bachelor level) subject-teacher curricula do not include pedagogical studies. Although there are some subjects the student can chose from special teacher-training curricula, it is not the common practice that they do. Most of the future teachers must get their pedagogical competence during the master level studies. Thus, with the purpose to make one step in evaluation of Estonian first-level teacher-training curricula and find out the range of methods that future teachers meet during their bachelor-level studies we examined three teacher-training curricula at the University of Tartu: Educational Science (humanities) bachelor's studies 2009/2010, Educational Science (Math and Sciences) bachelor's studies 2009/2010, and Educational Science (Sciences) bachelor's studies 2009/2010.

Studied teacher-training curricula prepare several-subject teachers. Accordingly, the common part of each studied Curriculum is made up of Module 1 (24 ECTS), which consists of educational science, general educational and psychological disciplines, and Module 2 (24 ECTS), a field-specific module of humanities, science or math and science. The common part is also known as the ground module (48 ECTS). The elective part of the curriculum consists of 24 ECTS disciplines field- and orientation modules, the student must choose 2 from the mentioned different specialty orientations. In addition, the student chooses the elective subjects (12 ECTS) from the provided list. Furthermore, there are optional subjects that can cover various fields and can be taken also from other higher education institutions (18 ECTS), and the Bachelor's thesis (6 ECTS).

Considering the teachers’ main obligations mentioned above and the skills they need to possess for completing these obligations on one hand, and the common knowledge of high school teachers’ discipline-centeredness (subject-centeredness) and lack of psychological-
pedagogical preparation on the other hand the questions were raised: what are these teaching methods that are used in future teachers’ preparation? Are there used the teaching methods that give teachers the skills to help their students to develop the communication competence?

**Method**

The aim of this study was to find out the proportions between the certain teaching methods used in bachelor level teacher training programs. Detailed overviews of every subject-course that constitute the three curricula were studied with a special attention to the teaching forms used in the course descriptions. The teaching forms that Study Information System used in the study offers, are lecture, practicum, seminar, colloquium, individual lesson, e-learning, self-directed study, and practice. Educational Science (humanities) bachelor's studies 2009/2010, Educational Science (Math and Sciences) bachelor's studies 2009/2010, and Educational Science (Sciences) bachelor’s studies 2009/2010 are the curricula studied.

Collected data was processed with content analysis. In some cases the contradictions were found in overviews – the numbers shown in general part of a course description did not agree with the numbers in the detailed program. In these cases the content of the lesson was taken into account and, according to the content, decisions were made whether the lesson is in form of lecture, seminar or practicum etc. In some cases the modules that should have consist of 624 hours of students work each consisted of less or more hours. In these cases the actual number of working hours shown in detailed overview was considered as 100%.

Our initial idea was to find out and analyze the proportion of the teaching methods generally in every curriculum but we were forced to give up that approach as it turned out that in modules within the same curriculum the different proportions of teaching methods are used. Therefore, analyzing them all together would have been confusing. It would have not given the right picture of the real situation. Accordingly, the general field specific modules, the orientation modules, and the subject field modules within every curriculum are studied and analyzed separately. The Module of the General Educational Subjects is common for all three curricula; therefore, the proportion of the module is described only one time. The modules of optional subjects of studied curricula differ in several subjects; therefore, the methodological structure of the modules in different curricula is described separately, and compared.
Findings

This chapter we will start with the analysis of the first part of the Ground module which is common for all three curricula. As mentioned above, the ground module consists of two parts: the Module of General Educational Subjects, and the General Field-Specific Module of Humanities, -Math and Science, and -Science. The general field-specific modules will be discussed secondly followed by the orientation modules, the subject field modules, and the modules of optional subjects.

The Module of General Educational Subjects is the main link between several-subject teachers’ curricula – it is common for every three curricula. Collected data show that self-directed study majors in the module: 389 hours of students work (62%) (see Figure 1), lectures are the second usual form of teaching general educational subjects: 136 hours (22%) followed by seminars: 62 hours (10%), and practicums: 37 hours (6%). The common policy of the University of Tartu dictates that two third of academic studies must consist of self-directed studies. Therefore, the considerable amount of self-directed studies is justified; nevertheless, it raises a question about the methods that the abovementioned learning and teaching form, self-directed study, includes.

![Module of General Educational Subjects](image)

Figure 1 Distribution of teaching methods in the Module of General Educational Subjects

Next we will observe the second half of the ground module – the general field-specific module of every curriculum. The General Field-Specific Module of Humanities does not include practicums, seminars or e-learning (see Table1). Self-directed study majors in the module of
humani
ties: 460 students working hours (65%), and the other teaching form used in the module is a lecture: 344 hours (35%). The General Field-Specific Module of Math and Sciences includes 16 seminars that is 3% of the amount of the field specific module, and 176 hours of practicums that is 28% of the module. Although the amount of practicums is remarkable, the content of the practicums fixed in course descriptions shows that these practicums include mainly completing exercises of math and informatics, no other active-learning techniques used. The General Field-Specific Module of Sciences consists of following proportion of the teaching methods: 308 hours of self-directed studies (49%), 284 hours of lectures (46%), 16 hours of practicums (2,5%), and 16 hours of seminars (2,5%).

<table>
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<tr>
<th></th>
<th>lectures</th>
<th>practicums</th>
<th>seminars</th>
<th>e-learning</th>
<th>self-directed study</th>
<th>total</th>
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</table>

Table 1  Distribution of teaching methods in the general field-specific modules

It is worth mentioning that informatics is one of the subjects in the General Field-Specific Module of Math and Sciences. Nevertheless, there is no sign of e-learning in course description. It leads us to the conclusion that the e-learning can in this case be considered as self-directed studies or other teaching forms. Therefore, we need to be careful while making final conclusions about methodological structure of studied curricula – some teaching forms might bear an ambivalent character.

Subsequently, we will discuss the methodological proportions of the orientation modules. There are ten orientation modules in the curriculum of Educational Science (Humanities). The Orientation Module of Estonian Language consists of following proportions of teaching forms: 363 hours of self-directed studies (62,1%) (Table 2), 160 hours of lectures (27,3%), 48 hours of practicums (8,2%), and 14 hours of seminars (2,4%). The Orientation Module of Literature: 400
hours of self-directed studies (68%), 102 hours of lectures (17%), 48 hours of practicums (8%), and 38 hours of seminars (7%). The Orientation Module of History includes two forms of teaching: 466 hours of self-directed studies (75%), and 158 hours of lectures (25%). The Orientation Module of Human Studies: 378 hours of self-directed studies (61%), 150 hours of lectures (24%), 12 hours of practicums (2%), and 84 hours of seminars (13%).

The Orientation Module of Russian Language: 325 hours of self-directed studies (52%), 194 hours of lectures (31%), and 102 hours of practicums (17%). The Orientation Module of German Language: 368 hours of self-directed studies (59%), and 256 hours of seminars (41%). The Orientation Module of English Language (high school teachers): 322 hours of self-directed studies (59%), 148 hours of lectures (27%), and 74 hours of seminars (14%). The Orientation Module of French Language: 322 hours of self-directed studies (59%), 122 hours of lectures (22%), 96 hours of practicums (18%), and 6 hours of seminars (1%). The Orientation Module of English Language (secondary school teachers): 354 hours of self-directed studies (59%), 16 hours of lectures (3%), 176 hours of practicums (29%), and 58 hours of seminars (9%). The Orientation Module of Social Pedagogy: 442 hours of self-directed studies (71%), 116 hours of lectures (18%), 36 hours of practicums (6%), and 30 hours of seminars (5%).

<table>
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<tr>
<th>The Orientation Module of</th>
<th>lectures</th>
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<th>seminars</th>
<th>e-learning</th>
<th>self-directed study</th>
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</table>
Table 2 Distribution of teaching methods in the orientation modules of the curricula Educational Science (Humanities)

There are three orientation modules in the curriculum of Educational Science (Math and Sciences). As shows the table 3, the Orientation Module of Mathematics consists of 302 hours of self-directed studies (48%), 137 hours of lectures (22%), 166 hours of practicums (27%), and 19 hours of seminars (3%). The Orientation Module of Informatics: 295 hours of self-directed studies (47%), 132 hours of lectures (21%), 93 hours of practicums (15%), and 104 hours of e-learning (17%). The Orientation Module of Physics: 264 hours of self-directed studies (47%), 74 hours of lectures (13%), 144 hours of practicums (26%), and 68 hours of seminars (14%).

<table>
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<th>e-learning</th>
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</tr>
<tr>
<td>Informatics</td>
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<td>93</td>
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<td>104</td>
<td>295</td>
<td>624</td>
</tr>
<tr>
<td></td>
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<td>17%</td>
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</tr>
<tr>
<td>Physics</td>
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<td>144</td>
<td>68</td>
<td>0</td>
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<td>550</td>
</tr>
<tr>
<td></td>
<td>13%</td>
<td>26%</td>
<td>14%</td>
<td>0%</td>
<td>47%</td>
<td>100%</td>
</tr>
<tr>
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<td>104</td>
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<td>22%</td>
<td>5%</td>
<td>6%</td>
<td>48%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 3 Distribution of teaching methods in the orientation modules of the curricula Educational Science (Math and Sciences)

The curriculum of Educational Science (Sciences) consists of four orientation modules. The Orientation Module of Physics which overlaps with the Orientation Module of Physics described within the curriculum of Educational Science (Math and Science); therefore, we will not describe it here. The Orientation Module of Geography consists of following proportions of teaching forms: 369 hours of self-directed studies (58%) (Table 4), 252 hours of lectures (39%),
4 hours of practicums (1%), and 15 hours of e-learning (3%). The Orientation Module of Chemistry: 387 hours of self-directed studies (60%), 94 hours of lectures (15%), 60 hours of practicums (10%), and 92 hours of seminars (15%). The Orientation Module of Biology: 326 hours of self-directed studies (52%), 132 hours of lectures (21%), and 166 hours of practicums (27%).

<table>
<thead>
<tr>
<th>The Orientation Module of</th>
<th>lectures</th>
<th>practicums</th>
<th>seminars</th>
<th>e-learning</th>
<th>self-directed study</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics</td>
<td>74</td>
<td>144</td>
<td>68</td>
<td>0</td>
<td>264</td>
<td>550</td>
</tr>
<tr>
<td></td>
<td>13%</td>
<td>26%</td>
<td>14%</td>
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<td>47%</td>
<td>100%</td>
</tr>
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<td>0%</td>
<td>2%</td>
<td>58%</td>
<td>100%</td>
</tr>
<tr>
<td>Chemistry</td>
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<td>60</td>
<td>92</td>
<td>0</td>
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<td>624</td>
</tr>
<tr>
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<td>15%</td>
<td>0%</td>
<td>60%</td>
<td>100%</td>
</tr>
<tr>
<td>Biology</td>
<td>132</td>
<td>166</td>
<td>0</td>
<td>0</td>
<td>326</td>
<td>624</td>
</tr>
<tr>
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<td>21%</td>
<td>27%</td>
<td>0%</td>
<td>0%</td>
<td>52%</td>
<td>100%</td>
</tr>
<tr>
<td>Total</td>
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<td>160</td>
<td>15</td>
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<td>2438</td>
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<td>6.5%</td>
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<td>55%</td>
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</tr>
</tbody>
</table>

Table 4 Distribution of teaching methods in the orientation modules of the curricula Educational Science (Sciences)

Subsequently, the methodological proportions of the subject field modules will be discussed. There are 10 subject field modules in the curriculum of the Educational Science (Humanities). The data is shown in table 5. The Subject Field Module of Estonian Language consists of following proportions of teaching forms: 374 hours of self-directed studies (60%), 205 hours of lectures (33%), and 45 hours of practicums (7%). The Subject Field Module of Estonian Literature: 368 hours of self-directed studies (59%), 126 hours of lectures (20%), and 130 hours of seminars (21%). The Subject Field Module of History and Civic Education: 436 hours of self-directed studies (70%), and 188 hours of lectures (30%).

The Subject Field Module of Russian as Foreign Language and Literature consists of following proportions of teaching forms: 404 hours of self-directed studies (64%), 204 hours of lectures (33%), and 20 hours of practicums (3%). The Subject Field Module of German Language and Literature: 368 hours of self-directed studies (59%), and 256 hours of seminars.
(41%). The Subject Field Module of English Language and Literature (high school teachers): 276 hours of self-directed studies (59%), 96 hours of lectures (20,5%), and 96 hours of seminars (20,5%). The Subject Field Module of French Language and Literature: 368 hours of self-directed studies (59%), 224 hours of practice (33%), and 32 hours of practicums (5%). The Subject Field Module of English Language and Literature: 286 hours of self-directed studies (62%), 6 hours of lectures (1%), 126 hours of practicums (20%), and 106 hours of seminars (17%). The Subject Field Module of Educational Sciences: 394 hours of self-directed studies (63%), 170 hours of lectures (27%), 8 hours of practicums (1%), and 52 hours of seminars (9%).

<table>
<thead>
<tr>
<th>Subject Field Module of</th>
<th>lectures</th>
<th>practicums</th>
<th>seminars</th>
<th>e-learning</th>
<th>self-directed study</th>
<th>total</th>
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<td>0%</td>
<td>60%</td>
<td>100%</td>
</tr>
<tr>
<td>Estonian Literature</td>
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<td>130</td>
<td>0</td>
<td>368</td>
<td>624</td>
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<tr>
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</tr>
<tr>
<td>History and Civic Education</td>
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<td>0</td>
<td>436</td>
<td>624</td>
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<td>Human Science</td>
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<td>0</td>
<td>382</td>
<td>626</td>
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<td>100%</td>
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<td>Russian as Foreign Language and Literature</td>
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<td>0</td>
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<td>624</td>
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<td>0%</td>
<td>41%</td>
<td>0%</td>
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<tr>
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<td>96</td>
<td>0</td>
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<tr>
<td>French Language and Literature</td>
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<td>624</td>
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<td>5%</td>
<td>0%</td>
<td>59%</td>
<td>100%</td>
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<tr>
<td>English language and literature (II)</td>
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<td>126</td>
<td>106</td>
<td>0</td>
<td>386</td>
<td>624</td>
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<td>20%</td>
<td>17%</td>
<td>0%</td>
<td>62%</td>
<td>100%</td>
</tr>
<tr>
<td>Educational Science</td>
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<td>8</td>
<td>52</td>
<td>0</td>
<td>394</td>
<td>624</td>
</tr>
<tr>
<td></td>
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<td>1%</td>
<td>9%</td>
<td>0%</td>
<td>63%</td>
<td>100%</td>
</tr>
<tr>
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<td>0</td>
<td>3756</td>
<td>6090</td>
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<td>12%</td>
<td>0%</td>
<td>61,5%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 5  Distribution of teaching methods in the subject field modules of the curricula Educational Science (Humanities)
There are three subject field modules in the curriculum of the Educational Science (Math and Sciences). The Subject Field Module of Mathematics consists of following proportions of teaching forms: 352 hours of self-directed studies (56%) (Table 6), 138 hours of lectures (22%), 98 hours of practicums (16%), and 36 hours of seminars (6%). The Subject Field Module of Informatics: 446 hours of self-directed studies (63%), 72 hours of lectures (10%), 110 hours of practicums (16%), and 74 hours of seminars (21%). The Subject Field Module of Physics: 358 hours of self-directed studies (57%), 128 hours of lectures (21%), 80 hours of practicums (13%), and 58 hours of seminars (9%).

<table>
<thead>
<tr>
<th>Subject Field Module of</th>
<th>lectures</th>
<th>practicums</th>
<th>seminars</th>
<th>e-learning</th>
<th>self-directed study</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics</td>
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<td>98</td>
<td>36</td>
<td>0</td>
<td>352</td>
<td>624</td>
</tr>
<tr>
<td></td>
<td>22%</td>
<td>16%</td>
<td>6%</td>
<td>0%</td>
<td>56%</td>
<td>100%</td>
</tr>
<tr>
<td>Informatics</td>
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<td>110</td>
<td>74</td>
<td>0</td>
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<td>702</td>
</tr>
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<td></td>
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<td>16%</td>
<td>11%</td>
<td>0%</td>
<td>63%</td>
<td>100%</td>
</tr>
<tr>
<td>Physics</td>
<td>128</td>
<td>80</td>
<td>58</td>
<td>0</td>
<td>358</td>
<td>624</td>
</tr>
<tr>
<td></td>
<td>21%</td>
<td>13%</td>
<td>9%</td>
<td>0%</td>
<td>57%</td>
<td>100%</td>
</tr>
<tr>
<td>Total</td>
<td>338</td>
<td>288</td>
<td>168</td>
<td>0</td>
<td>1156</td>
<td>1950</td>
</tr>
</tbody>
</table>

Table 6 Distribution of teaching methods in the subject field modules of the curricula Educational Science (Math and Sciences)

<table>
<thead>
<tr>
<th>Subject Field Module of</th>
<th>lectures</th>
<th>practice</th>
<th>seminars</th>
<th>e-learning</th>
<th>self-directed study</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics</td>
<td>128</td>
<td>80</td>
<td>58</td>
<td>0</td>
<td>358</td>
<td>624</td>
</tr>
</tbody>
</table>

There are four subject field modules in the curriculum of the Educational Science (Sciences). As shown in Table 7 the Subject Field Module of Geography consists of 368 hours of self-directed studies (59%), 156 hours of lectures (25%), 88 hours of practicums (14%), and 14 hours of seminars (2%). The Subject Field Module of Chemistry: 373 hours of self-directed studies (60%), 159 hours of lectures (25%), and 92 hours of practicums (15%). The Subject Field Module of Biology: 271 hours of self-directed studies (46%), 301 hours of lectures (51%), 5 hours of practicums (1%), and 9 hours of seminars (2%).
<table>
<thead>
<tr>
<th>Subject Field</th>
<th>21%</th>
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<th>9%</th>
<th>0%</th>
<th>57%</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geography</td>
<td>156</td>
<td>88</td>
<td>14</td>
<td>0</td>
<td>368</td>
<td>626</td>
</tr>
<tr>
<td></td>
<td>25%</td>
<td>14%</td>
<td>2%</td>
<td>0%</td>
<td>59%</td>
<td>100%</td>
</tr>
<tr>
<td>Chemistry</td>
<td>159</td>
<td>92</td>
<td>0</td>
<td>0</td>
<td>373</td>
<td>624</td>
</tr>
<tr>
<td></td>
<td>25%</td>
<td>15%</td>
<td>0%</td>
<td>0%</td>
<td>60%</td>
<td>100%</td>
</tr>
<tr>
<td>Biology</td>
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<td>5</td>
<td>9</td>
<td>0</td>
<td>271</td>
<td>586</td>
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<tr>
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<td>1%</td>
<td>2%</td>
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<td>100%</td>
</tr>
<tr>
<td>Total</td>
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<td>2460</td>
</tr>
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<td>11%</td>
<td>3%</td>
<td>0%</td>
<td>56%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 7  Distribution of teaching methods in the subject field modules of the curricula Educational Science (Sciences)

The Module of Optional Studies of studied three teacher-training curricula overlaps in majority of subjects. Therefore, only one figure is used in current paper – the Module of Optional Subjects of Educational Sciences (Humanities) (Figure 2). Distribution of teaching method in the same module of other curricula is given only in the text. The differences in these modules are dictated by the fact that in the curriculum of Educational Sciences (Math and Sciences) and Educational Sciences (Sciences) there are more courses offered. The curriculum of Educational Science (Humanities) officially includes 18, Educational Science (Math and Sciences) 25, Educational Science (Sciences) 34 optional subjects. Subjects are mostly of amount 3 ECTS, some of 6 ECTS. Students can take from this module 12 ECTS, it means maximum 4 different (3 ECTS) subjects. Considering the fact that this is the only module offering didactics and active learning methods, it needs to be pointed out that this is not sufficient for future teachers.
While analysing the teaching forms used in this module, the conviction that there is not enough room for teaching (not to mention training) the students various teaching and learning methods deepens. The main accent in this module is also drawn on self-directed studies (65%/62%/61%) (Figure 2-4), lectures follow (16,5%/21,5%/22%), then several practices (8%/7%/8%), seminars (8%/8%/7%), and finally e-learning that is shown in different percentages, but basically means one subject which is web-based and is common for all three curricula.

In conclusion, results show that the main accent in the studied curricula lays on knowledge of the subjects that the teacher-training student specialises on – future math teachers’ curriculum is focused on math from different angles, language teachers’ in specific language and literature etc. Unfortunately there is a very few subjects in studied curricula that have special focus on subject didactics, not to mention the subjects that focus on methods of developing students’ communication competence.

In terms of methodology, self-directed studies predominate in the examined three educational science curricula followed by lectures. The General Field Specific Module and the Orientation Module of the curriculum of Educational Science (Math and Sciences) differ at this point: self directed studies are followed by practice, the lectures follow, then seminars and e-learning. In the curriculum of Educational Science (Humanities) seminars are ranking third, the practicum is rarely used, and (according to data collected) e-learning is used only in one subject.
In some cases e-learning is not fixated in detailed overviews, but it is mentioned that the course is partly web-based. In those cases the e-learning is obviously fixated as lectures, practices or seminars – e-learning can also be built as one of these methods, only via Internet.

**Discussion**

As the results show, in terms of methodology self-directed study predominates in the examined three educational science curricula followed by lectures. According to Donald Bligh (1972), a lecture as a method of teaching is efficient for providing necessary information but a lecture does not stimulate the higher level thinking. The fact raises a question whether the content of general pedagogical and psychological subjects reaches students; furthermore, do the students develop the ability to use this knowledge in pedagogical context? Further we will consider the consequences that rise from classical lecture-based learning.

Even if The Estonian Teacher-Training Strategy (2009) does claim that the teacher-training curricula of the Tallinn University and the University of Tartu are composed in accord with The Professional Standards for Teachers it rather seems that as a result of classical lecture-based learning, our future teachers will not be able to develop their students’ social and communication competence, as they do not have the competencies needed. However, as mentioned above the teachers’ obligations are also to plan and direct the students’ learning process; to support their development and motivation; to involve students in planning the content and goals of their studies; to support students in developing their learning and social skills. Thus, developing future teachers’ social and communication competence should find its place in curricula – pedagogical and psychological competences are needed in involving students in planning their own learning process, giving feedback to students and their parents, and especially in supporting students in developing their learning and social skills. The abovementioned skills can hardly be taught via lectures.

University teachers often identify themselves more as researchers who are experts in their discipline and less as teachers who should adopt variety of teaching methods (Kember 2008). Despite that fact it is hard to find the university teachers who realise that they teach inefficiently, but it does not bother them as their main interest is the research. Erica Löfström (2008: 26), educational researcher from the University of Helsinki, argues that university teachers often
overestimate their use of meaningful learning at their lectures: in teachers’ opinion their classes are built according to the principles of meaningful learning, but students do not feel the same way. Nevertheless, the study conducted in Tallinn University showed that in students’ opinion at teacher-training courses the constructivist paradigm is used as the philosophical ground for teaching (Löfström 2008: 26).

According to the above-mentioned constructivist approach, which is acknowledged in modern educational sciences, students build their knowledge themselves and teachers’ job is to guide students in their learning process. For increasing the knowledge building efficacy special methods are needed – classical lecture that is based on knowledge-transmission model does not form deep approach to learning (Biggs and Tang 2007: 25), which should be one of the main goals in every level of education.

According to previous research, before having a teaching experience teacher-training students’ approach to teaching is inquiry-based and constructivist-based. They describe teaching science, for example, as a process. However, after the first contacts with a class during a lesson future teachers’ approach changes. The first teaching experience has been described as follows: “The idea of control emerged as being more important than learning content. The atmospheres of ‘thinking and questioning ideas’ were replaced by fears of constructivism as ‘chaos’ (Gilbert 2009: 434). It can be explained with the fact that during their studies teacher-training students have only heard, read, and thought about the concepts of constructivism, but they have rarely (or never) experienced and analyzed (after the experience) how these concepts work, nor have they tried in simulated situations to use these concepts in teaching process. This can be done in simulated situations where the students teach each other, for example.

One of the basic documents of European policy of teacher-training “Improving the Quality of Teacher Education” (2007) also raises the questions about efficiency of general learning and teaching methods – classical lectures versus problem based learning. In addition, the document discusses the topic of using those general methods in teacher-training. Likewise, Katri Raik (2006) the director of the Narva Colledge of the University of Tartu has argued that there are more discussions on what and why to teach and less about how, which should be the gap for teacher-training institutions to fill. It is inevitable that teachers who are taught using the narrow range of methods will have the poorer baggage of methods to apply in their own work at school.
The methods that help to form deep approach to learning are process drama, adventure training, and – wider – the outdoor education, which helps to focus and train students’ communication competence and other social skills. Some of the research written on adventure training does not show the improvement of the students’ positive psychological measures. “Though the OAE [Outdoor Adventure Education] course group revealed improvements across several positive psychological measures, these failed to reach statistical significance. Contrary to expectations, no significant differences were shown between the OAE course and control groups.” (Sheard & Golby 2006: 199) Even so, there is still a lot of subjective evidence that speaks for adventure training method. It is also important not to forget, while critically analyzing the results of various research, that there exist a lot of confounding variables while completing data about outdoor education value (see Ewert & Sibthorp 2009).

We have already emphasised the value of students’ social and communication competence, and have pointed out the lack of competent teachers to guide the students in their growth in that field. In fact, the teacher’s pedagogical competence to guide students in their social and communicational development becomes even more crucial in the light of new Estonian National Curriculum of General Education where the section of ‘crossing topics’ is accented (Põhikooli riiklik õppekava 2010; Gümmaasiumi riiklik õppekava 2010).

Conclusion

Examining three teacher-training curricula of the University of Tartu we have come to a conclusion that one of the weaknesses of teacher training curricula is the lack of balance between using a) lectures and academic reading for teaching theory (lectures, seminars); b) the teaching methods that give an opportunity to implement abovementioned theory in simulated situations (practicums); and c) real practice as a teaching method. It is inevitable that teachers who are taught using the narrow range of methods will have the poorer baggage of methods to apply in their own work at school. The use of active learning and teaching methods is needed in teacher education especially in different pedagogical and psychological subjects – these are the methods that help future teachers to learn to develop their students’ social and communication competence.
References


RESEARCH ON ICT INTEGRATION FOR ENHANCING QUALITY IN TEACHER EDUCATION: NATIONWIDE POLICY OR GLOBAL CHALLENGE?

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In today’s globalised world, many educational issues born as national problems can co-exist simultaneously in different countries, becoming a global challenge. The information & innovation-based society demands from the education systems continuous improvements to prepare new generations that are better prepared to take full advantage of the new social, cultural and economic conditions. Within this demanding scenario, educational systems are shifting their attention to the area of initial teacher training, recognizing teachers’ substantial impact on students’ performance (Barber & Mourshed, 2007).

Additionally, there’s a general consensus about the positive impact of Information and Communication Technologies (ICT) on economic development, and its relevance for human development has been recognized by international organizations (see UN Millennium Development Goals in www.un.org). Consequently, recognizing the potential benefits of ICT in different areas and in education in particular, many institutions claim that “there is a need for better information about what is happening [with ICT in education] at the national level as well as a better understanding of technological and pedagogical trends, reflecting the overall need for better empirical evidence as to the benefits of investment in ICTs for education (ICT4E) and their broader impact on society” (OECD, 2009b, p. 12)

In this context, Chile has a comparatively long history in the introduction and use of ICT in K-12 through the “Enlaces” project (see: Hinostroza, Hepp, & Cox, 2009), but only recently the Ministry of Education (MOE) has started to pay attention to the use of ICT in initial teacher training institutions. Among other areas, the MoE has researched ICT related standards for initial teacher training and the use of ICT in these institutions. In fact, it was the only non-European country participating in 2009 in the international study "ICT in Initial Teacher Training" conducted by the OECD2 for addressing this central matter. Results of this study provided a rich picture of the use of ICT in teacher education, resulting in a number of policy recommendations for strengthening the quality of this educational level. This work aims to present the most relevant results, as well as to share the main lessons learned from the application of this study in Chile.

This work might also constitute an opportunity for establishing international partnerships between European countries and Chile aimed at exchanging knowledge emerged from ongoing and future research projects, through an agenda oriented to a joint work aimed at quality assurance in teacher education by means of research about ICT integration.

KEYWORDS: Teacher Education – Quality Assurance – Initial Teacher Training – ICT – Chile

1 Research supported by Centre for Research on Educational Policy and Practice, Grant CIE01-CONICYT
2 Organization for Economic Co-operation and Development
1. **Introduction**

This paper presents the results of a study about the availability and use of ICT in the Initial Teacher Training institutions in Chile. Based on these results, it also discusses the ways in which they contribute to the overall quality assurance in the Teacher Education system in Chile. This research is part of the international project “ICT in Initial Teacher Training”, coordinated by the *Centre of Educational Research and Innovation* (CERI) of the OECD. The project stems from the concern shared by eleven European OECD member countries and Chile, about what they see as a deficit in their initial teacher training systems in providing the vision, experience and skills required for enabling future teachers to integrate ICT in their professional practices in compulsory education (primary and secondary). Thus, it aims to investigate the current inclusion of ICT in Initial Teacher Training in these countries from a comparative perspective, analyzing the future prospects as well as the possibility for formulating recommendations on applicable policies and intervention strategies. In addition, it is considered that the emerging results could make a significant contribution to the quality assurance systems in these countries, in regard of their teacher education.

The Ministry of Education of Chile, through its Center for Education and Technology (CET), has been developing a series of actions aimed at promoting the integration of ICT in Initial Teacher Training during the last years. Thus, it decided to participate in the above mentioned international study in order to know in depth the current national situation so as to provide more relevant information for designing national policies in this domain.

The study was guided by the following research questions:

1. What are the national frameworks and requirements regarding the use of ICT in initial teacher training in teacher training institutions?
2. What are the institutional contexts and requirements regarding the use of ICT in initial teacher training in teacher training institutions?
3. To what extent and in what ways is technology used in teacher education institutions?
4. In what ways are student teachers prepared to integrate technology in teaching in initial teacher training institutions?
5. If student teachers are not satisfactorily prepared, what are the main obstacles?
6. How is policy evaluated? Does practice correspond to policy?

This paper starts by presenting the national background about Quality Assurance and Initial Teacher Training in Chile; then, it describes the method followed during the study and after that, it presents the corresponding results. Finally, it shows the main findings and lessons learned, as well as a number of recommendations for contributing to reach higher levels of quality in the Chilean Teacher Education system.
1.1. National background

1.1.1. Initial Teacher Education in Chile

The Constitutional Comprehensive Teaching Act (National Congress of Chile, 1990), established that Initial Teacher Training in Chile can only be conducted by higher education institutions which are officially recognized by the State: Universities and, under certain conditions, Professional Institutes. The autonomy of higher education institutions is recognized by the Government through the Higher Education Council (autonomous public entity), both for public and private universities: once given their autonomy, Higher Education institutions are able to create careers and to issue degrees officially recognized nationwide (including Teacher Education programs).

The Initial Teacher Training offer is structured over the different education levels in the national system, covering all the pedagogical programs oriented to preschool, primary, special and secondary teachers. Furthermore, there are two main teacher training modalities:

- **Concurrent Training**: its curricula offer simultaneously: general training in a certain discipline, pedagogical training and specific preparation regarding the educational level in which future teachers will work. Generally, these programmes last eight to ten semesters.
- **Consecutive Training**: oriented to those having a professional degree in any discipline, for obtaining a degree to teach in secondary education. These programs offer training in pedagogy and specific didactics, and they usually last between two and four semesters.

The principle of free (non-paid) education is not present in Chilean higher education (as it is in the lower educational levels of the system), not even in public institutions. However, the government implements scholarships’ programmes and financial support to alleviate the situation of the most needed students, allowing them to access to a higher education system.

Currently, there are more than 700 Initial Teacher Training programs in Chile, involving approximately 65 institutions (each one of them is free to develop its own curricula).

1.1.2. Quality assurance in Higher Education in Latin America

During the last years, there have been several initiatives aimed to coordinate common policies on evaluation and accreditation in Latin America and the Caribbean countries. Among them, highlights the creation (in 2003) of the Ibero-american Network for the Quality Accreditation of Higher Education (RIACES), which developed a number of general guidelines, and launched an experimental process of regional accreditation for different careers (none of them is related to teacher education). Although this issue does not seem to have a high priority in the educational agendas for most of the countries in the region (Bizzozero & Hermo, 2009), this is not the case of Chile: quality control in teacher education is an important matter in the political agenda (Hopkins, 2006; Ministry of Education, 2010). In this sense, Initial Teacher Education is recognized as an area that has a double requirement of quality, namely as part of Higher Education and as a specific component of the education system. Additionally, the integration of ICT is a strong demand to the education system in order to accomplish the goals emerging from a globalised knowledge society.

1.1.3. Quality Assurance in Higher Education: the process of accreditation

Accreditation is a quality certification issued by the Government through the NAC -National Accreditation Commission- in regard of the quality of internal procedures in autonomous higher
education institutions in Chile. This process is voluntary for general higher education institutions, but is mandatory for the Initial Teacher Training institutions: it aims to verify, ensure and foster the quality improvement in Higher Education by identifying their strengths and weaknesses, and it has a period of validity, which has to be renewed when expired. This process was established by Law N° 20,129 which created the National System of Higher Education Quality Assurance (National Congress of Chile, 2006).

There are two scopes for the accreditation:

1. **Institutional accreditation:** consisting in analytical procedures applied at several domains within the higher education institutions (institutional management, teaching training degrees, research among others), to ensure their quality. The procedures carried out during the institutional accreditation include, at least, the stages of self-evaluation, external evaluation and the NAC verdict. The external evaluation is conducted by teams of experts, peers, or external agencies recognized by the government, selected in a joint process which involves the evaluated institution. National authorities highlights the central role of higher education institutions for developing internal processes for evaluating and assuring their quality, which is a shared concern with European quality assurance systems (Zgaga, 2010).

2. **Programs or careers accreditation:** involving procedures for verifying the quality of careers and programs offered by the higher education institutions, according to the corresponding goals. All the involved components associated (curricular design, infrastructure, human and physical resources, teaching-learning processes, among others) are certified for a period of up to 7 years.

### 1.1.4. ICT in Teacher Education in Chile: quality assurance and use of standards

During the last years, the Chilean Ministry of Education has been developing a policy in regard of ICT in teacher education. Within the context of the OECD project, this national policy is considered as belonging to two levels: 1) Presentation of optional recommendations at a national level, and 2) National implementation of competence frameworks.

At the beginning of the current decade, ICT was not included in the first national strategies aimed to implement standards and recommendations in Teacher Education, namely:

- **“Teaching standards for Initial Teacher Training”** (Ministry of Education, 2000): as part of a project for the Strengthening of Teacher Education (1997-2001), an evaluation system was created on the basis of these standards, oriented to assess the expected teachers’ quality at the end of the Teacher Education. In these standards, ICT was not included, despite its potential importance as part of the teachers’ knowledge.

- **“Framework for quality teaching”** (Ministry of Education, 2003): The Ministry of Education developed a set of guidelines describing what should be, know and do a “good teacher”. It was aimed to be used during the evaluation of students, teacher education programmes, and teaching practices, among other processes, grouping the criteria in different areas. No references to ICT were included.

During the last years, the Ministry of Education developed and implemented new initiatives oriented to establish a set of standards for the integration of ICT in Teacher Education, such as:

- **“ICT standards for the Initial Teacher Training”** (Ministry of Education, 2006): based on an Enlaces’ proposal (Centre of Education and Technology), contains five functional dimensions representing the most important aspects to be assessed: 1) pedagogical; 2)…

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3 Nevertheless, the obtaining of accreditation by an institution additionally leads to access to some institutional and student benefits (scholarships, studies financing) which motivates, in general, a noticeable interest for such procedure.
technical; 3) ethical and legal; 4) managerial; and 5) professional development. This proposal was developed to open a space for reflection and debate about the way in which the teaching institutions are responding to the demands of today’s society, from a more complex and integral vision of the adoption of the ICT, in order to prepare teachers with higher levels of professional competence, and enhancing the quality of the teacher education institutions.

- “Functional Map of ICT skills for Teacher Education” (Ministry of Education, 2007): implemented on the basis of the previous standards, aimed at guiding the decisions required to design and implement a modern teacher education curriculum efficient, effective and high quality, in order to provide the future teachers with those skills needed to exert their profession from a paradigm based on the renewed value of education in the 21st century.

It is worth mentioning that the implementation of this standards' framework is still voluntarily, however, its presence in the current scenario has a new relevance since late 2008, because of the compulsory accreditation process for Teacher Education careers. This means that there is a possibility to build up a joint work with the NAC to include the ICT standards for Initial Teacher Training as part of the national accreditation process. This focus might improve the understanding of the institutional diversity and foster creativity and innovation in teaching, learning and research in these institutions.

1.1.5. Quality Assurance in Higher Education: the ‘Inicia’ program

The national program called “Inicia”4, was launched in 2008 by the Ministry of Education for transforming institutions, curricula and practices in the Initial Teacher Training, in order to ensure and strengthens the professional quality of graduate teachers at a national level (Ministry of Education, 2010). This initiative proposes a set of pedagogical standards for highlighting a number of skills and knowledge that every future teacher should develop during its teacher education. Three main axes compose this program:

- Component 1: main curricular orientations and standards for teacher training programs;
- Component 2: assessment of teaching skills and knowledge;
- Component 3: programs for supporting the strengthening and modernization of Teacher Training Institutions.

In the first axis, a new general curriculum oriented to initial teacher education should be implemented. Although there are not explicit references to ICT in this component, the inclusion of the standards developed by the Ministry of Education in 2006 are taken for granted in the implementation of the program since “computational skills” are part of the general skills to be evaluated in the second axis “assessment of teaching knowledge and skills”, from 2010.

Therefore, and contextualized by the National System of Higher Education Quality Assurance, the INICIA program joined to the map of the Chilean public educational policies, in line with the current international trends.

In Chile, the results of the institutional evaluation processes and the applicable research projects are publicly disseminated. These results may be used in different ways, not just in regard of their possible consequences for the institutions, but also as a feedback for their staff, students and the general public. In addition, it is worth noting the use of findings to prepare indicators or national reports about the state of the teacher education system as a whole (which is the case of the present study), in order to obtain an overall picture of the state of initial teacher education, which is a valuable resource as an input for policy-making. This is, precisely, one of the main goals of the present study.

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4 Spanish Word for “Begins” (http://www.programainicia.cl)
1.2. **Conceptual framework**

The theoretical framework used in the study was adapted from the general model of SITES studies series (Kozma R., 2003; Law, Pelgrum & Plomp, 2008) and integrates different factors, clustered in 3 levels (as can be seen in Figure 1):

a) **Macro**: factors associated to national mechanisms of institutional evaluation (accreditation) and implementation of standards, at a system education level.

b) **Meso**: includes different institutional-related factors, such as: infrastructure; availability and access to ICT resources; technical and pedagogical support; curricular integration; institutional policies and interventions; as the most relevant.

c) **Micro**: factors directly related to the teaching and learning practices: frequency of ICT-use; types of practices; teachers and students’ characteristics; teachers’ vision; self-perception of competencies; among others.

Figure 1. Scheme of the conceptual framework used in the study *(adapted from Law et al, 2008, p. 19)*

As it could be seen, factors involved are numerous, varied and complex (Mumtaz, 2000; UNESCO, 2003; Drent & Meelissen, 2008, Pedró, 2008), and they interact dynamically (Janssen Reinen, 1996). The general idea is that these factors shape the future teachers’ profile in regard of their teaching skills and ICT competencies; therefore, they affect the quality of this education level: since some of them are considered as “manipulative”, they could be handled by institutions through appropriate interventions (ten Brummelhuis, 1995; Drent & Meelissen, 2008) in order to assure and enhance the quality in Teacher Education.

Consequently, and for clarifying their presentation, results emerging from the study will be further shown structured in the following dimensions addressed in a model developed by Scheuermann, Kikis & Villalba (2009): 1) Institutional policies; 2) Infrastructure and ICT resources; 3) ICT support; 4) Teachers’ beliefs and competencies on ICT use; and 5) Teaching and learning practices.
2. **Method**

To address the research questions, the study developed a methodological strategy combining both quantitative and qualitative data collection processes and techniques. Accordingly, the main activities were:

1. A **survey** applied (through self-applicable printed questionnaires) to 46 teacher training institutions (about 75% of national total) which participated voluntarily. The surveyed actors who responded the questionnaires were: 46 deans; 495 teachers; 164 mentors; 1675 students; 233 recent graduates and 50 technical or pedagogical responsible. Questions covered different issues, related to the above mentioned factors.

2. **Case studies**: carried out in five institutions selected according to the international rationale and other complementary criteria. They included individual interviews (personal and/or by phone), focus groups, observations, and documental analysis.

This paper involved statistical methods including descriptive, linear correlation and multiple regression analysis. Fieldwork was conducted from June to September, 2009, and it was coordinated by a team from the Institute for ICT in Education (University of La Frontera), as a member of the Centre for Research on Educational Policy and Practice (CEPPE).

3. **Results**

As it was said before, this section presents the results of this study, structured in different subsections corresponding to the dimensions addressed in the conceptual framework:

3.1. **Institutional policies**

3.1.1. **Curricular integration and policies for supporting ICT-based innovations**

According to the deans, ICT are mostly integrated into the curriculum just in some specific areas (83%) and not in a cross-curricular way. In addition, 56% of the surveyed deans reported that explicit objectives about students’ pedagogical ICT-related competencies are present in less than half of teacher education’ syllabi. Regarding the existence of an institutional policy to sustain innovations in teaching based on ICT, nearly 63% of the deans responded affirmatively. Meanwhile, almost 70% of the surveyed authorities reported the existence in their institution of an area or department dedicated to support pedagogical innovations with ICT by teachers.

3.1.2. **Institutional offer for teachers’ professional development**

Most of the institutions provide ICT-related courses for teacher trainers as optional activities. This aspect emerges a relatively weak one, because whilst teachers’ professional development on ICT use is not an institutional requirement, it remains strongly attached to teachers’ commitment and personal initiative. In fact, only 54% of teacher reported their participation in a workshop or course about ICT (general or pedagogical use) during the last five years. However, it’s interesting to remark that deans confer relatively high priority levels to teachers’
acquisition of ICT-related competences in aspects such as: teaching innovation by using ICT, integration of ICT by specific actions, and the identification of good practices to integrate ICT.

3.1.3. Assessment and use of standards

Most of the actors coincide (with percentages ranging from approx. 65% to 77%) that they do not perceive the existence of formal assessment activities in regard of students’ ICT competencies. Furthermore, just a minor percentage of the opinions reported the application of standards as part of the evaluation processes (from 13% of the deans, up to 30% of students). In this case, differences are statistically significant between private and public institutions, since private institutions reported a more frequent application of standards. Quite noteworthy it that not all actors who perceived the application of standards in their institutions were capable to classify or identify the standard’s type: excepting for the most frequently mentioned standards (*ICT standards for the Initial Teacher Training*), the others were just for internal use, or constitute general rules or guidelines taken as references during the evaluation processes. This finding shows that the use of standards is not yet a usual practice in Teacher Education institutions.

3.2. Infrastructure and ICT resources

Regarding the main infrastructural indicators, the ratio students per computer has an overall mean of 17; all the institutions have a website and provide access to the Internet: 96% of them provide broadband access and 91% have a Wi-fi network. In addition, 59% of the institutions reported to have a LMS/VLS system supporting –in average– 53% of the courses. Almost 75% of teachers have their own personal computer in their institutions. In relation to the access and availability of ICT resources for teaching and learning purposes, the most available and accessible are computers and projection systems (more that 80% of teachers reported that they are available, at least in some of the classrooms). Among the resources with the lowest availability, it could be mentioned: interactive whiteboards, video-conferencing systems, digital cameras and mobile devices. There were not found significant differences on this topic, depending on the institutional funding system (public or private).

3.3. Institutional ICT support

In regard of the availability of technical and pedagogical support for teaching and learning with ICT, approximately 95% and 80% of teachers reported, respectively, the existence of technical and pedagogical support. Clearly, the actors point out the existence of more technical than pedagogical support in their institutions. In respect of the quality of these types of support, results show that the quality of technical support is slightly better rated than the pedagogical support; however, both overall rates were ranked between “medium” and “good” quality.
3.4. Teachers’ beliefs and competencies about ICT integration

3.4.1. Teachers’ self-perceived competencies

Teacher trainers reported high levels of comfort on ICT use, either at home or in academic activities: 95% and 93% of them said that they felt “fairly or very comfortable” about using ICT at home and at class, respectively. Even more, teachers’ self-perceived levels of ICT competencies exceed the students’ ones: this fact could contribute to dismiss the argument about a generation gap between teachers and students.

3.4.2. Teachers’ beliefs about the importance of students’ learning of ICT

In regard of teachers’ visions about the importance of students’ learning of ICT, results show a prevalence of ICT uses related to the organization of teachers’ work; and a lower presence of the uses associated to ICT integration in teaching. Thus, it may be observed that teachers’ would assign a greater preponderance to the functional dimension of ICT as a management tool, over its pedagogical dimension.

3.5. Teaching and learning practices

Results reveal that teacher trainers seem to use ICT in a basic and undiversified way, involving a relatively limited set of digital resources (mainly, computers and projection systems: almost 80% of teachers reported that they use them “half of the classes” or more): this suggests that teachers are not taking advantage of the potential of ICT. Moreover, results are consistent with former studies (see, for example, Kozma, 2003; Law et al., 2008; OECD, 2009a) regarding the preponderance of ‘traditional’ teaching and learning activities (i.e. students working as a group at same pace) when compared to the ‘emerging’ or ‘innovative’ ones (such as students working autonomously at own pace or determining their own learning goals, among others).

On the other hand, frequencies of activities related to the explicit teaching about how to teach with ICT, are significantly lower than the frequencies that only include the use of ICT by teachers. Consequently, it seems that one of the main students’ problems is not just about learning how to use ICT, but how to learn the way to integrate them pedagogically in their future work.

Finally, the present research determined the influence of different factors on the frequency of teaching and learning activities with ICT. In regard of the basic pedagogical practices, associated to habitual teaching work, the most relevant factors are the availability of ICT resources in the classrooms and teachers’ level of self-perceived competences for using ICT; on the other hand, both learning activities and more complex teachers’ activities, were predicted by factors such as pedagogical support, students’ confidence level for using ICT with pedagogical purposes, and the importance attached by teachers to their students’ learning of ICT (among the most significant). These findings highlight concrete ways to foster the use of ICT in Teacher Education, as well as for enhancing the overall teaching quality through the promotion of high-level teaching activities.
4. **Lessons learned**

On the basis of a pragmatic perspective, the emerging scenario seems to be relatively unfavorable since the pedagogical use of ICT carry out in Chilean institutions of Teacher Education is—in general—restricted to a set of basic teaching and learning activities, whereas the more advanced and complex activities present low frequencies. In this sense, it seems that the Initial Teacher Training in Chile is not fully preparing yet the future teachers for the knowledge society’s demands.

Among the main findings and their corresponding recommendations, we can mention:

- Results seem to suggest that availability and access to ICT resources are necessary conditions but apparently they are not enough to promote the integration of ICT in teaching: although there is a wide variation among the institutions regarding infrastructural issues, they have—in general terms—acceptable levels. Therefore, results present a sort of underuse of ICT resources: many of them (such as interactive whiteboards, video-conferencing systems and mobile devices) are practically unused; meanwhile, resources such as the “PC plus projector” are considered as excessively used, being the target of students’ criticism.

- Given that the presence of internal evaluation processes is low, and the use of standards is even lower, it is necessary to promote and sustain self-evaluation processes on institutional policies, as well as on teaching and learning practices, in order to ensure the quality of teaching; adopting at the same time, standards related to the teachers and students’ ICT competences, and the expected goals about the use of digital technologies as well.

- As a positive aspect, is necessary to highlight that, on the one hand, the majority of the factors influencing on the different pedagogical activities with ICT in Teacher Education belong to the micro level; on the other hand, all of them can be categorized as “manipulative”, thus, it could be inferred the possibility for the institutions to impact on these factors through specific policies and strategies (such as an adequate professional development offer, provision of ICT infrastructure in the classrooms, and new proposals oriented at reaching higher levels of self-perceived competencies both in teachers and students, among other actions). However, results seems to show that is not convenient to keep developing proposals which are only based on the provision of standard ICT resources, or the offering of professional development opportunities related to basic ICT use, since these actions only would promote a higher frequency of repetitive and simple activities associated to a basic management of ICT teaching processes. Hence, is reasonable to expect that quality of teaching would not be significantly affected by these actions.

- A feasible recommendation to consider is related to the implementation of incentives’ mechanisms, aimed at promoting innovative projects in respect of teaching and learning practices with ICT in Teacher Education.
Another recommendation is related to the convenience of creating the adequate conditions for the generation of new scientific knowledge in this field, for encouraging research projects aimed to study—in particular—the relationship between ICT integration in Teacher Education and the Specific Didactics corresponding to the different disciplines. In this sense, an interesting line for further research is opened through this work for future projects aimed at promoting a higher quality in Teacher.

In regard of the relevance of this study’s contribution, it is necessary to point out that this research is the first on its type carried-out in the country. The results obtained might highlight several key issues in order to provide relevant information for supporting the design and implementation of policies and intervention strategies (at a national and/or institutional level) in regard of the most significant factors that have an impact on the pedagogical activities with ICT, which promotion is consider necessary for fostering a more complete, updated and innovative Initial Teacher Training in Chile as well as for assuring the quality of this education level.

As it was said in the title of this paper, this issue arose as a demand for national policies, but at the same time is a shared concern at international level, becoming a global challenge. In this sense, this proposal might also constitute an opportunity for establishing international initiatives between European countries and Chile in regard of the exchange of knowledge emerged from ongoing and future projects and studies, through a research agenda oriented to a joint work aimed at assuring the quality in teacher education systems.

5. Acknowledgments

Our gratitude to the Ministry of Education of Chile, through its Center for Education and Technology (CET); and to the Centre for Research on Educational Policy and Practice (Grant CIE01-CONICYT), for supporting this research. We are also grateful to the authorities of the institutions participating in this research, for their collaboration and readiness.

6. References


Abstract. The educational system in Romania, in general, and pre-service and in-service teachers training, in particular, pass nowadays through many revisions. There are discussions regarding the integrated study of natural sciences at the secondary school level and, as a consequence, the reduction of the hours allocated to the study of these school subjects. This paper presents the results of an investigation conducted on a sample of 15 years old Romanian pupils regarding the importance of studying Natural Sciences. The research aims to investigate the subjects’ views regarding the difficulty of these disciplines, the teachers’ role for students’ success in the acquisition of specific knowledge, the causes of failure in learning Natural Sciences and the number of hours considered to be weekly necessary for teaching these disciplines. The results show that there is a need to revise the methods used for teaching these disciplines, to rethink some of the aspects of the science teachers training and, ultimately to revise the curricula by increasing the number of hours allocated for the study of natural sciences.

Key words: Romanian eight grade pupils, educational system, Science teachers, interest in Natural Sciences, teaching Natural Sciences

1. Introduction. The Curriculum of Natural Sciences in Romania

Policy makers, teachers and employers emphasize the importance of scientific literacy among citizens, for both individual and social success in the 21st century. However, research indicates that middle and high school students perform poorly on international tests and few undergraduate choose science as a major (Hussar, Schwartz, Boiselle & Noam, 2008). Educational systems across many countries face challenges to globalization and to huge flow of information that is daily provided to pupils, through various means of communication. During the last 20 years (between the Romanian revolution, in 1989, and 2010) Romanian Educational system has constantly changed, the changes being considered both positive and negative. The changes have targeted the structure of pre-university education, school curriculum, pupils’ assessment, and the development of school textbooks, territorial organization, and teachers’ lifelong education, that means almost all components of the educational system. The present pre-university education in Romania comprises pre-school education, primary education (compulsory), lower secondary education (gymnasium) and higher secondary education (high school education).

1.1 The school curriculum

The current school curriculum has been designed in 2000 and implemented in 2004, and subsequently has passed through some changes. Some of the features of the present curriculum are presented below:

a) the five curriculum cycle structure (MEN-CNC, 2000, p.5);
b) the integration of school disciplines in seven curricular areas: (1) Language and communication (2) Mathematics and Natural Sciences (3) Man and Society (4) Arts (5) Physical education and Sports (6) Technology and (7) Counseling and guidance. The curricular areas are the same for both the compulsory schooling and the high secondary education, but their weight per key-stage and grade is variable;
c) the focalization on competence, defined by the educational policymakers as “a structured set of knowledge and skills acquired through learning. Competence allows us to identify and solve, in a variety of contexts, typical problems for a certain field of activity” (MEN- CNC, 2000, 30);
d) the stipulation of a set of attitudes and values that pupils have to develop, for each discipline, during an educational cycle.
In Table 1 we have provided a detailed description of the central features of the present Romanian curriculum.

Table 1. Curricular key stages

<table>
<thead>
<tr>
<th>Key stages</th>
<th>The main goal</th>
<th>Age</th>
<th>Education levels</th>
<th>Grade</th>
<th>School subjects in the area of Natural Sciences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialization</td>
<td>Accomplishing pre-specialization with a view to an efficient integration in the specialized higher education or on the labor market</td>
<td>19</td>
<td>Lyceum upper cycle</td>
<td>XIII</td>
<td>-</td>
</tr>
<tr>
<td>Reinforcement</td>
<td>The in-depth study in the chosen profile and specialization, ensuring at the same time a general instruction based on the common core and on the options in the other curricular areas</td>
<td>17</td>
<td>Completi on year</td>
<td>XI</td>
<td>Biology, Physics, Chemistry (Science/ integrate curriculum)</td>
</tr>
<tr>
<td>Observation and orientation</td>
<td>Orienting pupils in order to optimize their school options and subsequent professional career</td>
<td>15</td>
<td>First cycle of lower secondary school</td>
<td>IX</td>
<td>-</td>
</tr>
<tr>
<td>Development</td>
<td>Developing the basic skills necessary for pursuing one’s education.</td>
<td>12</td>
<td>VI</td>
<td>-</td>
<td>Biology, Physics</td>
</tr>
<tr>
<td>Basic acquisition</td>
<td>The pupils’ adjustment to the requirements of the school system and initial literacy</td>
<td>8</td>
<td>II</td>
<td>-</td>
<td>Knowledge of the environment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7</td>
<td>I</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6</td>
<td>Preparation year</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

As can be seen in the table presented above, learning in the field of Natural Sciences is done mainly through separate disciplines such as Physics, Chemistry, and Biology, a special case being represented by pupils in Humanistic profiles, who study Sciences, an integrated approach, in the 11th and 12th grades. Further, there are pupils in Schools of Arts and Trade who study Sciences until 11th grade.

1.2 The subject’s curriculum

The subject’s curriculum is the main teaching instrument that describes the ideal conditions for successful learning. In Romania, there is a curriculum for each discipline. The subject’s curriculum specifies two types of competencies:

- general competencies, defined for each subject and developed during the whole high school education; they are highly general and complex;
- specific competencies, defined for each subject and developed during one year of study; they have their roots in the general competencies and represent stages in the acquisition of the latter.

For example, in the case of the general competence “Theoretical and practical problem solving through particular methods”, the specific competencies are:

- compare and classify phenomena and characteristics of physical phenomena in the studied areas;
- solve theoretical or applied problems referring to the practical activity of the studied areas;
- analyze the causal relationships that emerge in the development of physical phenomena in the studied areas (Physics, eighth-grade, MECI, 2009).
The role of specific competencies specified in the school curricula is to support teachers in selecting and formulating the objectives of classroom lessons (the operational objectives). The elaboration of operational objectives is carried out in relation with the content of teaching, established through school programs. For instance, Physics, Chemistry and Biology content that teachers have to teach at eighth-grade level is presented in the table below.

Table 2. The topics of school subjects (Physics, Chemistry and Biology) of eighth-grade students

<table>
<thead>
<tr>
<th>Physics</th>
<th>Chemistry</th>
<th>Biology</th>
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<tbody>
<tr>
<td>Fluid Mechanics; Heat;</td>
<td>Simple substances with practical use;</td>
<td>Plants and animals in different life environments;</td>
</tr>
<tr>
<td>Electric charge; Electric</td>
<td>Compound substances with practical use;</td>
<td>Factors in the spread of living organisms;</td>
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<tr>
<td>circuits; Electromagnetism;</td>
<td></td>
<td>Trophic relationships in ecosystems;</td>
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<tr>
<td>Optical instruments;</td>
<td></td>
<td>Equilibrium in ecosystems.</td>
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<tr>
<td>Radiations.</td>
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</table>

As can be seen in Table 2, the content is mainly mono-disciplinary. Teachers and students are responsible for identifying interdisciplinary themes and if they don’t find such themes – and actually teachers and students hardly ever have such initiatives – the students’ knowledge remain fragmented.

1.3 Criticism of the current curriculum

The main criticism regarding the current curriculum in Romania emphasizes the gap between the curriculum content and the skills necessary in the labour market, the huge amount of information delivered in schools (32-36 hours per week, with 14-18 disciplines), the lack of relevance of the content for students career and future, the distance from the international practice which promotes the eight key competencies established by the European Union (Presidential comission 2007, p. 8).

Regarding the Science curriculum, the main criticism highlights: the high theoretical emphasis in teaching Science, the lack of practicability, the lack of flexibility, the difficult specialized terms used in textbooks and in teaching Science, the monotonous subjects and teaching methods, its orientation toward past and the evaluation of students through direct reproduction of the content, without active participation and interest of students (Frangopol, 2009).

1.4 The aims of the present study

Generally, we can notice that the Romanian educational system needs essential changes and improvements in order to create Scientific literate citizens. We consider that if we want our students to be scientific literate citizens we need to take into consideration their opinions regarding the study of Science in schools. Thus, the present study aims to investigate pupils’ opinions regarding the importance of studying Natural Sciences in eighth grade. Specifically, we have investigated the pupils’ views regarding the difficulty of Physics, Chemistry and Biology, the teachers’ role for pupils’ success in the acquisition of specific knowledge, the causes of failure in learning and the number of hours considered to be weekly necessary for teaching these disciplines. Thus, the questions that the present study aimed to answer are:

- What are the pupils’ attitudes and interest toward studying Natural Sciences?
- What is the role of teachers in succeeding in Natural Sciences, according to pupils’ opinions?
- What are the main difficulties pupils encounter when studying Natural Sciences?
- How many hours per week pupils consider to be necessary for studying Natural Sciences?

Interest can be defined as a differential likelihood of investing energy in one set of stimuli rather than another (Csikszentmihalyi & Hermanson, 1995 apud Baram-Tsabari & Kaadni, 2009) and represents a form of intrinsic motivation, which involves doing something because it is inherently interesting or enjoyable (Ryan & Deci, 2000 apud Baram-Tsabari & Kaadni, 2009). Interest is very important in learning because contributes to
students’ connection with the content (affective response) and to the maintenance of that connection for sufficient time to be able to learn (persistence) (Ainley, Hidi & Berndorff, 2002). Individual interest can be defined in terms of specific domains such as school subjects, for example literature, history, mathematics (Ainley, Hidi & Berndorff, 2002) and can influence future educational training and career choices (Kahle, Parker, Rennie, & Riley, 1993; Krapp, 1999; Levy, 2003; Lindahl, 2007 apud Baram-Tsabari & Kaadni, 2009).

Pupils’ attitudes toward Science have been investigated by several researchers (Matthews, 2004; Osborne & Collins, 2001; Jones et al., 2000; Gardner & Tamir, 1989; Hofstein et al., 1986; Yager & Yager, 1985; Yager & Bonnstedter, 1984 apud Prokop, Prokop & Tunnicliffe, 2007) and thus there is research that has confirmed that Science is boring for many students, difficult, not relevant to the pupils’ lives, more attractive to boys and less interesting to older students (Ebenezer and Zoller, 1993; Delpech, 2002, Ramsden, 1998, Schibeci and Riley, 1986; Francis and Greer, 1999 apud Prokop, Prokop & Tunnicliffe, 2007). In Romania, there is a lack of research regarding pupils’ interest and attitudes toward Science. Yet, we consider that is critical to know pupils’ attitudes toward Science since there is research indicating that pupils’ attitudes toward a school subject influence their interest and performance in this domain and that there might be a need for increasing pupils’ attitudes toward Science. Thus, the present research is indeed relevant in the Romanian educational context, since there is a lack of studies that focus on pupils’ attitudes and interest toward Science school subjects such as Physics, Chemistry and Biology.

2. Methodology

2.1 Participants. This study was conducted on 65 eight grade from two schools in Cluj-Napoca county, Romania. The age of the participants in the present sample ranged between 14 and 16 years old, with the mean age 14.37 years. 52.3% of pupils in the sample were females and 47.7% of pupils in the sample were males. As can be seen in Figure 1, the majority of the pupils in the present sample have 14 years old, the difference between males and females being insignificant. Pupils distribution by age and sex in the sample reflect almost accurately the situation that can be encounter in almost every eight grade classroom in Romania, the expected age in the eight grade being 14 years old and the distribution of pupils by sex in Romanian classrooms being almost equally, for both boys and girls. 61% of the pupils in the present sample are from “Simion Barnutiu” School and 38.5% are from “Alexandru Vaida Voievod” School.

![Figure 1: Pupils distribution by age and sex](image)

2.2 Measures. In order to assess pupils’ opinions regarding the study of Natural Sciences in school we have developed an instrument with 21 items measured on a five point Likert scale and 9 open questions. Pupils were also asked to provide information regarding their age, sex, school, city and grade. The 21 Likert scale was developed to assess pupils’ attitudes toward Natural Sciences and the open questions were developed in order to identify the main difficulties that pupils encounter when studying Natural Sciences. In Table 3 we present the items of the instrument used in the present investigation. Pupils were asked in a pencil and paper session to answer on a five point Likert scale at all 21 items, the answers ranging from “strongly agree” to “strongly disagree”. The open questions that we’ve further addressed aimed to identify the main difficulties that pupils encounter when studying Natural Sciences, how many hours per week they...
consider to be necessary for studying Natural Sciences in school and how many hours per week pupils study Natural Sciences in school?

<table>
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<th>Table 3: Items from the instrument used in the present study</th>
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<td><strong>Dimension</strong></td>
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<td>Difficulty level of Natural Sciences</td>
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<td>Pupils’ interest in Natural Sciences</td>
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<td>Pupils’ pleasure in studying Natural Sciences</td>
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<td>The importance of Natural Sciences for future career and</td>
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2.3 Procedure. The schools that have been included in the present study constituted the pilot sample that the researcher has chosen by contacting one teacher from each school. Each teacher has administered the questionnaire, choosing at least one eight grade classroom from his/her school. The teacher from “Simion Bărnuțiu” School has administered the questionnaire at two eight grade classrooms while the teacher from “Alexandru Vaida Voievod” School has administered it at one eight grade classroom. Pupils participation in the study was voluntary and anonymous.

3. Results

3.1 Pupils’ interest and attitudes toward Natural Sciences

As can be seen in Figure 2, a high percent of pupils from the sample declared that Natural Sciences are not very difficult. Regarding Physics, 60% of pupils considered that this discipline is difficult while 40% considered that Physics is not a difficult discipline. Regarding Chemistry, the percent of pupils that considered this discipline to be difficult (52,3%) is almost equal to the percent that stated that Chemistry is not a difficult discipline (47,7%). Biology is considered by the pupils in the sample to be the least difficult Science discipline. Thus, only 21,5% of them claimed that Biology is difficult while 73,9% considered that Biology is not at all difficult. The possible explanation for these results might be that Physics and Chemistry are taught more on a theoretical level, despite their experimental character. While Biology also involves problem solving too, this can be easily done by observing the events in the real world, and solving theoretical IN Biology problems has a low weight.
In Figure 3 is represented pupils interest in studying Natural Sciences. As can be easily seen from the graphic, the majority of pupils claimed that they consider Physics, Chemistry and Biology to be interesting school subjects. Thus, eight grade pupils from the present sample are interested in studying Natural Sciences, with the highest percent (93.8%) being interested in Biology.

The majority of eight grade Romanian pupils experience pleasure when studying Natural Sciences. As Figure 4 shows, 66.2%, 67.7% and 80% of pupils stated that they enjoy studying Physics, Chemistry and respectively Biology. The highest percent of pupils that enjoy to study Natural Sciences is in the Biology. While a high percent of pupils stated that they enjoy studying natural Sciences, in the case of Physics and Chemistry there is also a high percent of pupils that stated they actually don’t like to study at these school subjects, the percent being 32.3% both in Physics and Chemistry.
As can be seen from the graphics presented above, eight grade pupils from the present sample are interested in studying Natural Sciences and consider that these school subjects are not too difficult. Further, pupils are aware of the importance of these domains for their future careers and life or for their health, as presented in Figure 5. Thus, 83,1% of pupils considered that everybody should learn Science, 87,7% considered that Science is useful for solving everyday problems, 86,2% agreed and strongly agreed that Science is necessary for their future careers, 80% agreed or strongly agreed that Science helps them to improve the quality of their lives, and 93,8% agreed or strongly agreed that Science helps them improve their health.

Figure 5: Pupils’ opinions regarding the importance of Science

Despite of the high percent of pupils that have a positive attitude toward Science, only a slight percent of them would like to become scientists. In Figure 6 we represented the percent of pupils that stated they would like or wouldn’t like to become a scientist.

Figure 6: I would like to become a Scientist

As can be seen in Figure 6, only 36,9 % of pupils in the present study stated that they would like to become scientist while 49,2% stated they wouldn’t like to become scientist, with 13,8% being undecided regarding this aspect.
3.2 Pupils’ opinions regarding the role of teacher in succeeding in Natural Sciences

Pupils consider that Physics, Chemistry and Biology teachers are very important for their success in learning science, as shown in Figure 7. 91% of pupils agreed and strongly agreed that the role of the teacher is important in succeeding in Physics, 88% of pupils agreed and strongly agreed that the teacher is important in succeeding in Chemistry and 91% agreed and strongly agreed that the teacher is very important for their success in Biology.

**Figure 7: Pupils’ opinions regarding the role of teacher in succeeding in Natural Sciences**

As can be seen, pupils consider that teachers’ support is important for their success in learning Natural Sciences. But it is also important to understand how efficient pupils consider Science teachers to be. Thus, in Figure 8 we illustrate the distribution of pupils’ answers to the statement “I consider that Science (Physics / Chemistry / Biology) teacher is efficient.”

**Figure 8: The teacher is efficient**

Pupils answers show that they believe that Physics/Chemistry/Biology teachers are efficient persons. These answers are consistent with the answers pupils have provided at the statement regarding the role of teachers for their success in learning Science.
3.3 The main difficulties pupils encounter when studying Natural Sciences

Even if pupils are interested in studying Natural Sciences, they also encounter some problems which prevent them for successfully learning these school subjects. In Figure 9 we represented the main problems pupils encounter when learning Natural Sciences. Pupils’ answers to three open questions were analysed in order to identify the main themes concerning the difficulties in learning Natural Sciences. Few pupils in the sample didn’t provide an answer to these questions, and most of them (5 pupils) were in Biology. In some pupils answers we have identified two or three themes. The most frequent problem pupils encounter when studying Natural Sciences is the lack of understanding Science concepts from earlier grades, and thus the difficulty to understand the fundamental concepts and formulas in the eight grade. 59% of pupils mentioned that the lack of understanding Science from earlier grades is a problem in studying Physics, 52% of pupils considered it as a major concern in Chemistry and 48% mentioned it as a problem in learning Biology. Another problem that pupils mentioned is that Natural Sciences are difficult, with the highest percent of pupils that stated this being in Chemistry (26%). The teaching methods that teachers use were mentioned as a problem mainly in Biology (13%) and Chemistry (14%). The last problem that pupils mentioned is that Natural Sciences are not useful in someone’s life, but there is a slight percent of pupils that have mentioned this as a problem: 8% in Physics, 7% in Chemistry and 14% in Biology.

Figure 9: The main difficulties pupils encounter when studying Natural Sciences

3.4 The number of hours per week pupils study and would like to study Natural Sciences

Regarding the number of hours per week that pupils would like to study Natural Sciences, there is a slight difference between the number of hours pupils study in the present and the number of hours they would like to study, as can be seen in Table 4. Thus, the mean of hours in Physics is 2.04 for both the number of hours pupils study in the present and the number of hours they would like to study. Concerning Chemistry, the mean for the hours pupils study in present is 2.13 while the mean for the number of hours they would like to study is 2.09. In Biology, the mean for the number of hours pupils study in the present is 1.89 and the mean for the number of hours they would like to study is 2.33.
In Romania, pupils in the eight grade follow a single educational plan in which school subjects such as Biology, Chemistry and Physics are each taught 2 hours per week. According to the results presented in Table 4, the discipline in which pupils would like to study more hours per week is Biology.

4. Discussion and conclusions

Pupils’ attitudes toward Science influence their achievement in this school subject (Prokop, Tuncer & Chuda, 2007). Thus, the exploration and development of positive attitudes toward Science should be a major concern for teachers and educational policy makers. In the present study we have investigated pupils’ attitudes toward Physics, Chemistry and Biology, the teachers’ role for pupils’ success in the acquisition of specific knowledge, the main difficulties that eight grade pupils encounter when studying Natural Sciences and the number of hours considered to be weekly necessary for teaching these disciplines.

The high percentages of pupils that agreed and strongly agreed that Science is interesting and can help them to solve their daily problems, to improve their health and quality of life, or can help them in their future career indicate that eight grade pupils in the present sample have positive attitudes toward Science, particularly toward Biology, and that they are interested in studying Science. This is an important aspect in the Romanian educational system that policy makers and teachers should take into consideration when designing or presenting the content of Science curriculum, especially because there is research that has showed that students’ attitudes toward school science decline from the point they entry to secondary school (George, 2000; Ramsden, 1998 *apud* Cheung, 2007).

The declining interest of pupils in pursuing higher education in Science and science-related careers might be a major concern in Romania, like in many other countries (e.g. The High Level Expert Group on Human Resources for Science and Technology in Europe, 2004; The National Commission on Mathematics and Science Teaching for the 21st Century, 2000 *apud* Baram-Tsabari & Kaadni, 2009). As has been shown in the present study, half of the eight grade pupils have stated that they would not like to become scientist, with 13,8 percent being undecided if they would like or not to become scientists. We believe that, taking into consideration the high percent of pupils that would not like to become scientis, Romanian policy makers should include in the Science curriculum some practice hours during which students could go in different companies and associations to make various scientific investigations and to interact with people who are engaged in scientific research.

The role of teachers is important for pupils’ success in Natural Sciences, as was revealed in the present study. It is important to know that pupils consider that science teachers have an important role for their success in Science, because if they consider the information they receive from teachers the correct and authoritative information, they might rarely question and criticize it, and thus teachers shoud help pupils develop and use their critical thinking skills. Further, there is a need for teachers to engage in lifelong learning, in order to better help their students to understand and use relevant concepts and skills in Natural Sciences.

Even if eight grade pupils in the present study have positive attitudes toward Natural Sciences, they also encounter problems when studying Physics, Chemistry and Biology, problems that reduce their performance in

| Table 4: The number of hours pupils study and would like to study Natural Sciences |
|---------------------------------|---|---|---|
| What would you like to study Biology in school? | N | Mean | Std. Deviation |
| How many hours in a week would you like to study Biology in school? | 57 | 2.33 | 1.13 |
| How many hours in a week would you like to study Chemistry in school? | 56 | 2.13 | 1.11 |
| How many hours in a week would you like to study Physics in school? | 57 | 2.04 | 1.11 |
| How many hours in a week do you study Biology in school? | 57 | 1.89 | 1.38 |
| How many hours in a week do you study Chemistry in school? | 57 | 2.09 | 1.13 |
| How many hours in a week do you study Physics in school? | 57 | 2.04 | 1.01 |
| Valid N (listwise) | 53 | | |
these school subjects. The most frequent problems pupils have mentioned is the lack of understanding relevant concepts in Science from earlier grades, which makes difficult for them to understand fundamental concepts and formulas in the eight grade. This is a significant issue that teachers and educational policy makers should address in the primary school level, in order to enhance pupils’ knowledge and skills in Science in middle and high school level. We consider that a critical important aspect that teachers should take into account is the prior knowledge of pupils because, as research has suggested, pupils’ knowledge and experience play an important role in learning science and their prior knowledge can represent both a resource and a barrier to emerging understanding (Duschl, Schweingruber & Shouse, 2006).

We consider that although the sample of the present study was significant (65 eight grade pupils), the results must be replicated on a higher sample, in order to generalize our findings. Further, there is a need for more studies regarding pupils’ attitudes and interest in Science and the difficulties they encounter when studying Science on a sample of primary school pupils because, as we have seen, the pupils difficulties in understanding Science concepts and formulas start earlier than eight grade.

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Comparative study of teaching content in teacher education programmes in Canada, Denmark, Finland and Singapore

Jens Rasmussen and Martin Bayer

Keywords: Teacher education, content of teacher education, teachers’ knowledge base, comparative study.

1. Introduction
This article presents the results of a comparative study of the content in teacher education programmes for primary and lower secondary teachers (years 1-9(10)) in Canada, Denmark, Finland and Singapore. First and foremost, the study is a comparison between teacher education programmes in, on the one hand, Canada, Finland and Singapore, all of which score highly in international comparisons such as PISA and TIMMS, and on the other hand Denmark, which receives average scores, but it also functions as a comparison between all four countries. The study covers the following subjects: pedagogy, mathematics, and science.

In this study, we have included Canada, Finland and Singapore, i.e. three of the top-performing countries, and Denmark. Korea, which is among the top three in the PISA assessments, is not part of the study. Singapore, which achieves a top placing in TIMMS is, however. The reason for this is that Singapore has attracted particular interest within the educational debate in

In Canada, the compilation of teaching materials was carried out in the province of Ontario at the Faculty of Education, Ontario Institute for Studies in Education (OISE), University of Toronto, which is the largest and most prestigious provider of teacher education in the province. Of the four teacher education programmes offered, the one-year Bachelor of Education programme is the largest in terms of student population, and it is this programme which has been included in the study.

In Denmark the study includes the teacher education programmes at Zahle, University College Capital, in Silkeborg at University College VIA, and in Vordingborg at University College Sealand. These three programmes are located in a city, a large provincial town and a smaller provincial town respectively.

In Finland we analyse the content of the teacher education programme at the Department of Teacher Education, Helsinki University. The department offers both the class teacher programme (Grade 1-6) and the subject teacher programme (Grade 7-12). These programmes are both included in the study.

In Singapore all three programmes offered at the National Institute of Education (NIE): A four-year concurrent bachelor’s degree programme, a two-year concurrent diploma degree programme and a three-year Postgraduate Diploma in Education aimed at students who already have a bachelor’s degree but require an educational postgraduate qualification in order to teach at primary or secondary level are included in the study.
2. Theoretical framework and method

Variations and similarities
The comparison of variations and similarities in the content of the selected subjects in the four teacher education programmes is conducted on the basis of a number of concepts, referred to here as search and analysis categories. The argument for applying search and analysis categories is that, while it may be possible to compile information about the teaching content in the teacher education programmes without employing such categories, it is only with the help of conceptual categories that it becomes possible to consider the similarities between the programmes. The comparisons of the teaching content in the selected teacher education programmes are conducted using a matrix with the four teacher education programmes which are the subject of the analysis placed along the horizontal axis and the standardised categories which are applied placed along the vertical axis. As a result, the comparisons are conducted at this conceptual or categorical level (Rose, 1991), (Sartori, 1984).

Analysis of teaching content
The analyses of teaching content are conducted as text analysis on the basis of preselected and further differentiated search and analysis categories. The material is analysed along two dimensions. The first dimension, which is used to analyse the material within each of the three subject areas, builds on a distinction between four types of knowledge: scientific knowledge, scientific practice knowledge, professional knowledge, and professional practice knowledge. The second dimension, which is only applied to the analysis in the mathematics and science subject areas, builds on a distinction between three categories of content, i.e. subject knowledge, subject didactic knowledge, and knowledge about students. (Luhmann, 2002) (Rasmussen, Kruse, & Holm, 2007).

Scientific knowledge about education and teaching is knowledge about the educational system which is produced outside the educational system, with a different frame of reference than that employed by the educational system itself. Scientific knowledge is characterised by its distinction between true and false statements, an aspiration towards generalised or generalisable research results, the coordination of concepts which form the basis for observation and the range of conclusions by theory, and the application of specific and explicit methods.

In this study, we additionally distinguish between empirical scientific knowledge and analytic/theoretical scientific knowledge within the search and analysis category scientific knowledge. Empirical scientific knowledge can be generated through the application of either quantitative or qualitative methods. Analytic/theoretical scientific knowledge can be further divided into grand theory (philosophical, psychological, sociological etc.) and middle-range theories (e.g. Piaget’s adaptation theory, learning theories, theories about social inequality etc.), a conceptual distinction with its roots in sociology, but here applied more broadly (Merton, 1968).

Scientific practice knowledge is knowledge the researcher and research community generates by itself and for itself concerning the research process. It typically comprises reflections on the theory of science, not least questions of an epistemological nature, as well as reflection on research methodology and its possible applications and limitations.

Professional knowledge about education and teaching is knowledge which is produced within the educational system about the educational system and for the educational system, i.e. with
the educational system’s own frame of reference. Professional knowledge is characterised by its distinction between instructive and not-instructive statements regarding teachers’ practice. As such, professional knowledge acts as the educational system’s own way of correcting professional practice according to a self-generated set of criteria for determining success or failure. Professional knowledge is developed with the aim of solving concrete problems in local contexts and therefore mainly comprises context-specific knowledge. Its function is to explain practice in order to enable intervention aimed at improving practice.

The search and analysis category professional knowledge is further divided into evidence-based professional knowledge and philosophical professional knowledge. Evidence-based professional knowledge can refer to either research or experimental and developmental work and action research, while philosophical professional knowledge is characterised by offering normatively-based directions for practice. This distinction has its foundations in two different characteristics of professional knowledge: on one hand, professional knowledge can be based on more or less systematic descriptions of experiences from educational practice; on the other hand, professional knowledge can consist of ideas or ideals for successful practice. Evidence-based professional knowledge referencing research can additionally be distinguished dependent on the empirical or analytic/theoretical nature of this research, while philosophical professional knowledge can have either an analytic or a normative orientation.

Professional practice knowledge about education and teaching is the type of knowledge which practitioners generate by and for themselves with the goal of facilitating a more effectual practice. Professional practice knowledge is characterised by a distinction between useful and not-useful knowledge, a distinction which combines two criteria for professional practice, namely if it ‘works’, and whether it does so in a reasonable manner, i.e. in a way which the practitioner finds acceptable in terms of e.g. ethical considerations. Professional practice knowledge is reflection on practice and, as such, experiential knowledge whose function is to contribute to an improvement of the concrete everyday educational practice. Professional practice knowledge is not subject to additional divisions.

Figure 1: Overview of search and analysis categories for knowledge forms
We look to capture the content elements in mathematics and science using the second dimension concerning categories of content. A distinction is applied here between subject knowledge, subject didactic knowledge and knowledge about students, i.e. student knowledge.

- **Subject knowledge** (the subject’s ‘what’) is the subject-specific knowledge which student teachers require in order to be able to teach a subject and to diagnose the difficulties pupils might have in learning a particular aspect of the subject.

- **Subject didactic knowledge** (the subject’s ‘why’, ‘how’ and ‘whereto’) has to do with the knowledge about objectives and curricula (in general and more concretely), planning lessons, communication and teaching methods, and assessment (both internal and external).

- **Student knowledge** (the subject’s who) includes developmental psychology (what can be expected at various age levels), learning theory (knowledge about human learning), and knowledge about social and cultural diversity (student diversity) (Tenorth, 1994), (Weinert & Helmke, 1997).

**Figure 2: Overview of search and analysis categories for content**

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**Validity and reliability**

In order to ensure the validity of the study of teaching content in the four teacher education programmes, i.e. ensure congruence between the objectives of the study and comparison and the actual findings, the study only includes content which can be found in publicly available curricula and syllabi, examination reports, lists of recommended literature and the like.

It is difficult in a study such as this one to ensure reliability, i.e. that the findings would be the same if the study was repeated. In order to ensure a certain degree of reliability, we strove for a high degree of transparency in the compilation and analysis of the selected material. This was achieved by presenting the material in a bibliographical format (APA-standard) which makes it possible to find the same sources again such that descriptions and characterisations can be verified (Rasmussen, Bayer & Brodersen 2010).

**3. Teaching content in the teacher education programmes in the individual countries**

**Ontario, Canada**

At the Ontario Institute for Studies in Education (OISE), literature is listed in the syllabi for all the subjects that form part of the programme for the Bachelor of Education, a total of 75 items. Of these, 71 have been identified and analysed. Five titles are used in more than one subject.

At the level of the four overall categories of knowledge, seven entries are categorised as scientific knowledge, one as scientific practice knowledge, 37 as professional knowledge, and
26 as professional practice knowledge. As such, professional knowledge comprises the largest share of entries, but professional practice knowledge also represents a significant proportion of the total number of entries. These two knowledge forms combined comprise a 63 of the 71 entries.

The modest number of entries within the categories of scientific knowledge and scientific practice knowledge deal with empirical research findings (2), analytic/theoretical knowledge (1), and findings based on a combination of empirical and analytic/theoretical research (4). In the category of scientific practice knowledge, there is one item concerning research methodology and none on the theory of science.

In terms of professional knowledge, the majority are evidence-based (30 entries). Of these, 16 refer to both research and practice, while five refer only to research and nine only to practice. Six items deal with normatively oriented philosophical professional knowledge and one refers to both evidence and philosophy. Professional practice knowledge comprises the second largest share of entries (26).

The teaching content of the Bachelor of Education focuses strongly on professional knowledge and professional practice knowledge. It would seem clear that an attempt to strike a balance between evidence-based professional knowledge and knowledge regarding what is possible in the classroom, i.e. professional practice knowledge, is central to the selection of the programme’s teaching content. As a prerequisite for their admission to the programme, students have a four-year bachelor’s degree, typically within two school subjects, and this explains why the content is dominated by subject didactics. Furthermore, the teaching content in the programme is clearly aimed at developing the performativity of the teacher-to-be and at providing guidance in successful teaching strategies. There is a particular emphasis on teaching classes with high levels of student diversity in terms of ethnicity and culture.

**Denmark**
At the three educational institutions included in the study, 373 items are reported from the subjects Educational Science, Psychology and General Didactics: of these, 199 have been identified and analysed. For the subjects Science and Technology and Physics/Chemistry, 48
out of a total of 181 items have been identified and analysed. For Mathematics, 52 out of 113 items have been included. As such, a total of 299 items have been analysed in this study.

At the overall level, the content of the analysed material is divided between all four categories of knowledge: 30 entries are categorised as scientific knowledge, one as scientific practice knowledge, 249 as professional knowledge, and 11 as professional practice knowledge. Professional knowledge thereby comprised by far the largest proportion of items.

The 30 items within the category of scientific knowledge can be further distinguished between 20 entries based on analytic/theoretical research and ten entries based on empirical research. The single item belonging to the category of scientific practice knowledge concerns the theory of science.

The vast majority of items within the professional knowledge category are based on evidence-based research (141), while 25 refer only to practice. Philosophical professional knowledge is at the centre of 80 entries, 18 of which are both normatively and analytically oriented, 22 purely analytic, and 40 entirely normative. Professional practice knowledge comprises 11 items.

Figure 4: Denmark

The analyses of teaching material in the Danish teacher education programmes show a strong focus on professional knowledge. Scientific knowledge features to a limited extent while professional practice knowledge is minimally represented and scientific practice knowledge virtually absent. A considerable proportion of the material is based on research. The large number of items included at the three educational institutions (677) is also worth noting and can be seen as evidence of the relative pedagogical freedom given to instructors.

Finland

For the class teacher programme at the University of Helsinki (Grade 1-6), all compulsory items are included in the study (22). They are divided between just three of the four categories of knowledge: scientific knowledge, scientific practice knowledge, and professional knowledge. There are no examples of professional practice knowledge. At this overall level, three items are categorised as scientific knowledge, nine as scientific practice knowledge, and 16 as professional knowledge.
Scientific knowledge in the form of results of empirical research comprises the smallest category with three entries. The second largest category is scientific practice knowledge of which the majority deal with research methodology (7-8), the remainder concerning theory of science (1-2). However, professional knowledge comprises the largest proportion of teaching materials included in the Finnish class teacher education programme. 12 items are evidence-based referring to empirical and/or theoretical research (primarily theoretical). Four entries are categorised as philosophically oriented professional knowledge, three of which have a normative basis.

Figure 5: University of Helsinki, class teacher

For the subject teacher programme at the University of Helsinki (Grade 7-12), all compulsory items are again included in the study (25) and categorised according to the four overall categories of knowledge. Scientific knowledge includes four items, three of which can be placed within the analytic/theoretical middle-range theory sub-category. Scientific practice knowledge comprises four items, all dealing with research methodology. Professional knowledge includes seven items which are evidence-based referring to primarily theoretical and/or empirical research, in addition to two items based on evidence from studies of practice. A further four items are philosophical professional knowledge with a normative foundation. Finally, four items can be categorised as professional practice knowledge.

Figure 6: University of Helsinki, subject teacher

Many of the items included in the subject teacher education programme are the same as those found within the class teacher programme. However, the subject teacher education
programme does differ from the class teacher education programme in that it incorporates professional practice knowledge comprising material which provides inspiration for assessing teaching and language learning.

**Singapore**
For the teacher education programmes at the National Institute of Education (NIE), 13 items are reported of which 11 have been identified and analysed. The majority of these items fall within the category of evidence-based professional knowledge (10). The teaching materials within these subjects are to a large extent instructive and in some cases almost prescriptive in relation to educational practice. Most of the items are founded on evidence-based knowledge from research (3) and from experimental and development work (6). The only exception is teaching material regarding students with special needs which is both analytic and normative in its philosophical orientation (1). It is noteworthy that the normative basis is drawn from political-administrative declarations of intent regarding Singapore as an inclusive society.

**Figure 7: National Institute of Education (NIE)**

The educational theory and practice subjects in Singapore are characterised by a general focus on questions with a direct relevance for the decisions teachers make when teaching: questions concerning e.g. planning lessons, classroom management and assessment. Meanwhile, relatively little attention is paid to e.g. questions concerning educational theory (Bildung) and other themes within the philosophy of education. When questions about goals and values are dealt with, it is primarily with reference to the country’s current political priorities and only to a far lesser degree to the possible historical and philosophical foundations.

**4. Comparison**
The study of differences and similarities in the teaching content of the teacher education programmes in the four countries has been conducted first and foremost as a comparison between on the one hand, the four top-performing countries Canada, Finland and Singapore, and on the other hand, Denmark. However, differences and similarities between the individual countries are also dealt with to the extent that they offer a contribution to a more nuanced overall picture.

**Differences and similarities in terms of knowledge base**
The content in the selected subjects within the teacher education programmes in the four countries has been analysed on the basis of two theoretically-founded sets of categories. The first set of categories teaching content in terms of different types of knowledge and has been applied to teaching materials in all three subject areas (educational theory and science, mathematics, and science). The second set of categories concerns the specific type of content and is applied to the mathematics and science subject areas.
Professionally-oriented knowledge
As a broad observation, a significant amount of the teaching content in the teacher education programmes in each of the four countries can be classified as professional knowledge. For the teacher education programmes at OISE and the University of Helsinki, this is true of approximately half the entries analysed. The proportion of material falling within this category is even higher in Denmark and at NIE. Even though the teacher education programmes in the Top-3 countries are research-based and situated within a university environment, while the Danish teacher education programmes are development-based and situated at university colleges, the teaching content is in all cases clearly aimed at preparing students to enter the teaching profession and perform teaching work.

Only by further analysing the content of this professional knowledge do the differences between the four teacher education programmes become apparent. In order to do so, the category of professional knowledge has been further divided into the sub-categories of evidence-based professional knowledge and philosophical professional knowledge. Evidence-based professional knowledge is the type of knowledge which refers to the results of research or of action research and experimental and development work. Philosophical professional knowledge is characterised by providing normatively-based guidelines for practice.

Evidence-based professional knowledge
At OISE, the great majority of items within the category of professional knowledge are categorised as evidence-based professional knowledge (30), while a smaller number deal with philosophical professional knowledge (6). In Helsinki, one finds a similar distribution between evidence-based (12+9) and philosophical professional knowledge (4+4), especially in terms of the class teacher education programme. At NIE, evidence-based professional knowledge once again comprises the majority of entries (10), while only a single entry belongs within the sub-category of philosophical professional knowledge. Meanwhile, one finds a different pattern in the Danish teacher education programmes. As at NIE, professional knowledge comprises a considerable majority of the items, but the distribution between evidence-based and philosophically-oriented professional knowledge is quite different. In Denmark, evidence-based professional knowledge once again constitutes the largest proportion of the items classified as professional knowledge (106), but there are also a considerable number of items within the sub-category of philosophical professional knowledge (63). As such, the Danish teacher education programmes differ from those in the Top-3 countries by including a weighty share of philosophical professional knowledge.

The teacher education programmes in the four countries do not differ in terms of their employment of professional knowledge, but a clear difference can be observed between OISE and NIE on the one hand and Helsinki and Denmark on the other in terms of teaching content. This difference is that the first two programmes largely employ teaching material combining research-based knowledge with practical experiences and guidelines for practice, while the programmes in Denmark and Helsinki tend to keep these two elements separate to a much greater degree, and moreover, only utilise a small amount of teaching material which refers to practice. The latter is especially true of the Danish teacher education programmes. In this regard, the difference is not so much between Denmark and the Top-3 countries, but rather between the teacher education programmes in Ontario and Singapore and those in Helsinki and Denmark.

Philosophically-oriented professional knowledge
Philosophically-oriented professional knowledge comprises a substantial part of the content in the Danish teacher education programmes, which is not the case in the other three countries.
While philosophically-oriented professional knowledge is employed in these countries, it is only to a much lesser extent than one finds in Denmark. A considerable amount of the philosophical professional knowledge employed in Denmark is of a normative nature. Meanwhile, this is not the case in the other countries where items belonging to the analytic-philosophical professional knowledge sub-category dominate. There is therefore a clear difference between the teaching content of the teacher education programmes in Denmark and the Top-3 countries in terms of philosophically-oriented professional knowledge.

**Professional practice knowledge**
At OISE, a considerable number of items are included which can be classified as professional practice knowledge. No items are included within this category at NIE or in the class teacher education programme in Helsinki. The subject teacher education programme in Helsinki and the Danish teacher education programmes include only a modest number of items from the category of professional practice knowledge. On this point it is therefore OISE which stands out from the other countries’ teacher education programmes.

**Scientific knowledge**
Scientific knowledge is incorporated within the teacher education programmes in all four countries, although only to a limited extent at NIE. Of the other three countries, scientific knowledge is most predominant at the University of Helsinki and least at OISE with Denmark falling somewhere in between. The incorporation of the scientific results of empirical research is modest in all of the teacher education programmes studied. In terms of the results of analytic/theoretical research, a difference can be registered between the programmes at NIE, where this sub-category is not represented at all, and the programmes in the remaining three countries, where they are incorporated to a limited degree.

**Scientific practice knowledge**
Scientific practice knowledge, i.e. research methodology and theory of science, is well represented in the teacher education programmes in Helsinki with items concerning research methodology, while this type of knowledge is absent from the teacher education programmes in the other countries.

This overall picture of the distribution of knowledge forms among the teaching materials employed in the four teacher education programmes also more or less applies to the distribution within the three subject areas analysed: i.e. educational theory and practice, mathematics, and science.

**Mathematics and science**
In the subject areas mathematics and science, the teaching content has been further categorised according to whether it communicates subject knowledge, subject didactic knowledge and/or student knowledge. Here there is a clear distinction between the Top-3 countries and Denmark in that the content of the subject areas mathematics and science in the Top-3 countries only deals with subject didactic knowledge, while in Denmark, both subject knowledge and subject didactic knowledge are incorporated.

The best explanation for this difference is how the different teacher education programmes are structured. The programmes in two of the Top-3 countries are consecutive (OISE and NIE). In consecutive education programmes, subject knowledge within mathematics and science has been acquired prior to commencing the teacher education programme. In Helsinki, even though there is talk of a concurrent teacher education programme, teaching of subject knowledge takes place within the various disciplines’ respective departments, meaning that the Department of Teacher Education only concerns itself with the subject didactic aspects.
This is not the case in Denmark where teacher education programmes are entirely concurrent. As a result, the teaching of school subjects includes both purely disciplinary content and a subject didactic content. Danish teacher education programmes therefore also use textbooks concerning subject knowledge, which also applies to a certain extent at NIE. The textbooks employed within mathematics in the Danish teacher education programmes are aimed at maths teachers, while those employed within science (Nature and Technology, Physics/Chemistry) are also used at upper secondary schools.

Student knowledge plays only a small part in the subject areas of mathematics and science and would therefore seem to belong within the educational theory and practice subjects, especially educational psychology and sociologically-oriented subjects such as School and Society (OISE), The Social, Historical and Philosophical Foundations of Education (Helsinki) or Learning and Teaching in a Social Perspective (NIE).

**Differences and similarities in teaching content**
A closer study of content of items within the four types of knowledge does not reveal a clear pattern in terms of similarities and differences between the Top-3 countries and Denmark, or between each of the four countries.

**Scientific knowledge**
The teacher education programmes at OISE and in Denmark include the results of empirical research concerning increased student diversity within schools. This is a topic resulting from demographic changes, teaching of bilingual students, social diversity, poverty, children from socially disadvantaged backgrounds, and issues relating to educational opportunities and educational equality. The programmes also include scientific knowledge regarding individualisation and the development of children and young people within modern society.

The results of empirical research on teachers’ work, the teaching profession and restructuring are likewise included, as are the results of subject didactic research in mathematics and science lessons.

**Scientific practice knowledge**
At the teacher education programmes at the University of Helsinki, a considerable number of items concerning research methodology are included – which is not the case in the other three countries. The goal is to provide aspiring teachers with the necessary knowledge and expertise to be able to perform methodical and systematic analysis of their own teaching and to understand and relate to research results.

**Professional knowledge**
Professional knowledge covers a wide array of topics relevant to the teaching profession. Student diversity is a central theme, in particular how teachers can cope with this diversity and the resulting complexity. Issues covered here typically include: differentiated teaching; teaching students with special needs; ethnic minorities and refugees; gender, racial and cultural differences; special needs education; inclusion; intelligence; and classroom management. Another theme deals with the development of children and young people and the formation of their attitudes, their socialisation, and theories of learning. Teaching comprises a third theme within the category of evidence-based professional knowledge with topics including: (effective) teaching methods and their relevance in relation to different subjects and different students; the development and structure of positive learning environments; and assessment. Finally, one also finds themes such as school development and educational systems.
Within the realm of philosophically-oriented professional knowledge, particular attention is paid to educational theory (Bildung) topics, action competence and theories concerning democracy and democratic education, as well as recognition, care and the forming of relationships. This philosophical, normatively-oriented professional knowledge, which primarily assumes the form of reflections on educational theory, is a hallmark of the Danish teacher education programmes.

**Professional practice knowledge**

Within the category of professional practice knowledge, one finds items passing on teachers’ experiences with conducting courses of study in Danish and Mathematics; teaching of refugees; parent-teacher co-operation; and matters relating to information and confidentiality.

**Summary**

This comparative study does not offer proof of any clear difference between the Danish teacher education programmes and those found in the top-performing countries. While differences can be found in certain areas, in other areas there are greater differences between the four individual countries.

Professional knowledge comprises a significant proportion of the teaching content in the Top-3 countries as well as in Denmark. Teacher education programmes in each of the four countries are clearly professionally-oriented in this respect. Philosophically-based professional knowledge, much of which is normative in character, forms an extensive part of the body of professional knowledge within the Danish teacher education programmes, which is not true of the programmes in the Top-3 countries.

The teacher education programmes at OISE and NIE employ evidence-based professional knowledge referencing and combining research-based and practice-based knowledge. Meanwhile, in Denmark and at the University of Helsinki this type of knowledge for the most part solely references research. A similar difference applies in that the programmes at OISE and NIE more frequently employ literature combining research-based knowledge with practical guidance and experiences, while the programmes in Denmark and Helsinki keep these knowledge forms separate and only incorporate experiences from practice to a limited degree.

The teacher education programme at OISE is distinguished from the programmes in the three remaining countries by including a number of items from the category professional practice knowledge. The teacher education programmes at NIE are distinguished by incorporating only to a very limited degree the results of empirical research and by the complete absence of the results of analytic/theoretical research. The main distinguishing feature of the teacher education programme at the University of Helsinki is the inclusion of literature on research methodology within the category of scientific practice knowledge.

There is a difference between the institutions offering consecutive programmes (OISE and NIE) and those offering concurrent programmes (Helsinki and Denmark) in terms of the content of the subjects taught within the areas of mathematics and science. In the consecutively organised teacher education programmes, teaching content consists entirely of subject didactics, while the concurrent programmes also cover subject knowledge within these disciplines. The Danish teacher education programmes incorporate both subject didactic literature and subject knowledge literature in the same courses, while the programme at the University of Helsinki keeps the two areas of knowledge separate in subject didactic courses and courses within the subjects held at their respective departments within the university.
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Does initial teacher training meet the real needs?

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Abstract

OECD’s teacher study TALIS (Teaching and Learning International Survey) is an international comparative study, the main aim of which was to analyse the factors that influence effective instruction. The study showed that compared to other states the percentage of lesson time spent efficiently on learning and teaching and classroom disciplinary climate are the highest in Estonian schools. Estonian teachers value students’ activeness, creativity and consider their students’ peculiarities; however, our subject lessons are in most cases structured and students are provided with few opportunities for self-initiative research activities and creative tasks (TALIS, 2009).

Internationally there have been many studies concerning this issue and the findings show that there exist a few minor occurrences of inappropriate behaviour in novice teachers’ lessons; however, solving the cases of inappropriate behaviour has always been the biggest concern for novice teachers (Bullough, 1997; Eisenschmidt, 2006; Fuller, 1969; Glatthorn, 1995; Hargreaves, 2003; Kagan, 1992).

The previous study carried out among the students of Haapsalu College of Tallinn University (Eisenschmidt, Kasesalu, Löfström & Anspal 2009) showed that on their third year students begin to worry about whether and how they might cope with classroom management and are concerned about potential discipline problems.

The aim of the current study is to find out novice teachers’ main problems and their success experience; how they evaluate their acquired pedagogical knowledge; and to what extent they have applied this knowledge in their first two working years. The research method used is a written structured interview. Based on the interviews with graduates of the year 2008 and 2009 of Haapsalu College it will be found out what kind of `bottlenecks´ exist in initial teacher education and what kind of changes are needed in the training of teachers.

Keywords: initial teacher education, teacher education curriculum, first years of teaching, novice teacher
Introduction

According to the Estonian Teacher Education Strategy 2009—2013 teachers have the key role in education; they help to create the future of the Estonian school and its students. The success of the teacher in this role depends on the cooperation of different parties. The preparation and professional development of teachers is supported by the Estonian Ministry of Education and Research, state and local school owners, universities training teachers, schools and teachers´ professional organisations.

Haapsalu College of Tallinn University as a teacher training university regards the teacher training strategy as its basis, provides research-based training and supports the development of teacher´s competencies described in the teacher´s professional standard.

The aim of the current study is to find out novice teachers´ (the graduates of Haapsalu College) main problems and their success experience; how they evaluate their acquired pedagogical knowledge; and to what extent they have applied this knowledge in their first two working years. The research method used is a written structured interview. Based on the interviews with graduates of the year 2008 and 2009 of Haapsalu College, it will be found out what kind of ´bottlenecks´ exist in initial teacher education and what kind of changes are needed in the training of teachers.

The article gives an overview of the teacher´s professional standard, teacher education in Haapsalu College of Tallinn University and previous research on the same topic. In the empirical part novice teachers´ ideas and opinions about their coping with the teacher´s profession are compared and analysed.

1. Theoretical overview of the Estonian teacher´s professional standard, teacher training and induction year

1.1. Teacher´s professional standard in support of the teacher´s professional development

In the Estonian Teacher Education Strategy 2009–2013 the teacher´s professional development is seen as a continuous process. The strategy states that in 2013 schools in Estonia have dignified, motivated and competent teachers. They work and plan their professional development in line with the following principles: teachers enjoy a dignified social position; teachers are learners who can plan and evaluate their professional development; teachers support the development of their pupils; teachers offer guidance and teach learning skills; teachers are experts in their subjects and integrate different fields of knowledge; teachers use the help of their colleagues and parents in supporting their pupils´ development.

The teacher´s competence has been described by many states, as the circle of the people dealing with teacher training has widened substantially and clearer agreements are needed. In Estonia the description of the teacher´s competence has been given in the teacher´s professional standard Teacher V (Õpetaja V, 2005), which covers 8 important fields:
• planning and management of learning processes – a teacher ensures systematic activity both within one lesson and in the course of the whole school year;
• cooperation – involves learners, parents and colleagues in the planning of studies;
• creation of learning environment – creates a physical, mental and social environment that supports learning;
• raising motivation – finds out the levels, abilities and interests of learners and takes these into consideration;
• guided learning – guides learners to conduct their own learning;
• communication – creates an atmosphere of collaboration and mutual understanding;
• analysis and evaluation of learning processes and learners´ development – analyses the participation, development and results of the learner;
• the teacher´s professional growth and self-analysis – self-analysis is the basis of development.

OECD´s teacher study TALIS (Teaching and Learning International Survey) is the first international comparative study, the main aim of which was to analyse the factors that influence effective instruction.

The study showed that compared to other states the percentage of lesson time spent efficiently on learning and teaching and classroom disciplinary climate are the highest in Estonian schools.

According to the study the pedagogical convictions of Estonian teachers are among the most progressive and contemporary, yet the teaching methods applied in the classroom are more traditional than in other countries.

Estonian teachers value students´ activeness, creativity and consider their students´ peculiarities; however, our subject lessons are in most cases structured and students are provided with few opportunities for self-initiative research activities and creative tasks (TALIS, 2009).

Teachers´ self-efficacy plays an important role as self-esteem and success of the teacher depend on this: teachers with high self-efficacy have a bigger influence on their pupils, they can achieve good contact with them and can even motivate the pupils with learning disabilities. Low self-efficacy of Estonian teachers shows insecurity and little confidence in one´s ability to affect and motivate one´s pupils. This research gives an essential impulse to the development of the teacher education strategy in the future. It should certainly stress the need for wider public recognition of a good teacher, for the implementation of new assessment criteria, for the activities encouraging and supporting the cooperation of teachers and for the ways and stimuli that help to involve teachers in school innovation (bid 2009).

In the study TALIS it was assumed that a teacher´s professionalism can be influenced by creating a favourable learning and teaching environment. The main mechanisms through which it is possible to affect this environment lie behind the preparation and in-service training of teachers, school management, evaluation and feedback. In the class teacher´s curriculum and in-service training of Haapsalu College of Tallinn University it is very important to understand, shape and create possibilities for professional development.
1.2. About teacher education in Haapsalu College of Tallinn University

Teacher education in Haapsalu College is based on national aims and principles and the main objectives of the class teacher’s curriculum in Haapsalu College of Tallinn University are the following:
- to create opportunities for the growth of ethical and active-minded teachers;
- to support readiness to develop learners with different needs and personal characteristics;
- to support the development of pedagogical-psychological, subject and subject didactics-related competences;
- to develop readiness to shape the learners’ working habits and behaviour;
- to support readiness to maintain and develop the learning motivation of students;
- to develop readiness to cooperate with one’s colleagues and parents of learners;
- to develop readiness for lifelong learning.

In teacher training flexible models are implemented which take into consideration the educational system and students’ individualism. The initial teacher education curricula developed at universities enable to acquire the qualifications needed to teach several subjects at school (in Haapsalu College class teachers also acquire a minor of teacher of the English language in basic school) and to start pedagogical studies at the first stage of higher education. In initial teacher education lecturers and school practice supervisors apply methods which help future teachers develop their self-reflexion and competencies necessary for their professional development.

The expected study results of the class teacher’s curriculum in Haapsalu College are:
- a student has knowledge about the child’s development and learning;
- can use this knowledge to support learners with different abilities and personal characteristics;
- can plan one’s teaching and can analyse it according to the set goals;
- has knowledge about the attitude of pupils (I and II school stage) toward their studies and about the factors affecting their behaviour;
- can create a motivating learning environment for pupils;
- can cooperate with colleagues and parents.

Attention is paid to the content in educational studies and its implementation into practise, to guarantee the student teachers’ professionalism, to reinforce the role of preservice education in the university and to develop in service training for academic staff. Pedagogical practice proceeds from the idea that it is a long process to become a teacher, where a support system and guidance play an important role.

The current research is a continuation to a previous survey of the students of Haapsalu College (Eisenschmidt, Kasesalu, Löfström & Anspal 2009) that dealt with the readiness of students to start work as teachers and their fears about their future profession.

According to the survey the students from the first year do not identify the difference between the ideal and the experienced situation. The more they learn, the more worried they seem to become.
Students from the second and third years mainly express their worries about how to handle the real-life situations. Many feel that they fail in handling disciplinary problems. When the students have a possibility to practise more, they start talking about their experiences and most fears they used to have leave room for only one main concern – the lack of time that does not allow them to behave like they imagine a good teacher would. Some students express their worry that they might not be able to handle this and fail to choose the teaching profession because they feel that the job is too exhausting.

Most students express high intrinsic motivation to become a teacher throughout all their years of study. There is, however, a slight difference in their expressions – the students from the first year express their motivation separately from their role as a teacher. The students feel that they have “something in them”, perhaps a characteristic, ability or some aspects of personality that would make them good teachers. The students from the final year start to express a strong motivation to start work, although they admit that they still have a lot to learn.

1.3. The induction year – a support programme for novice teachers
Since 2004, according to the Framework Guidelines for Teacher Education young teachers who have just graduated from teacher training must undergo the induction year activities (Õpetajate koolituse raamnõuded, 2000).

The aims of the induction year are to support novice teachers’ adaptation to the educational institution as organisation, to further develop the competencies acquired in initial training, and to provide support in solving problems caused by the lack of experience. During the induction year a novice teacher is supported by a colleague – a mentor (Eisenschmidt, 2006).

Every year the monitoring of the induction year is carried out, which analyses the coping of novice teachers and gives essential feedback to teacher training institutions to develop their curricula.

The theoretical basis for the implementation of the induction year is a developed concept of Eisenschmidt (ibid 2006), which takes into consideration the trends in Estonian teacher education. The concept relies on authoritative theorists, among them Villegas-Reimers (2002) (teacher’s professional development is continuous; in addition to formal education the induction year and in-service training are important), Vonk (1983) (teacher’s development takes place in three dimensions), Glatthorn (1995) (three factors are important in the development of teachers - personal, contextual and special plans to support the teacher), Hargreaves (2003) (teacher’s development depends to a great extent on the school culture the teacher is working in).

The coping of teachers in the first working year(s) is naturally affected by a number of different factors. In the given research it is analysed to what extent previous studies support the development of a teacher and which issues need more attention in the future.
The above-mentioned dimensions and factors that for m the theoretical basis of the Estonian induction year programme (Eisenschmidt, 2006) have been illustratively combined in the following figure (Figure 1).

Figure 1. Dimensions and domains of teacher’s professional development (Theoretical frame of induction in Estonia, Eisenschmidt, 2006)

Based on the given model the development of the novice teacher is analysed in three dimensions (Vonk, 1983, Eisenschmidt, 2006):
- professional, which involves the teacher’s job-related coping.
Previous research has shown that novice teachers have problems with discipline, classroom management, planning, supporting students’ motivation, individualisation, assessment and cooperation with parents (Fullan, 1991):
- social, which involves adjustment to the new environment, professional relations with colleagues, school administration and pupils’ parents.
Novice teachers are largely affected by the work environment in their school and by how communication takes place in that environment. The studies of Glatthorn (1995), Rosenholtz (1989), Hargreaves (2003) and Vonk (1983) confirm the essential role of the environment.
- personal, which is related to the personal development of the teacher.
The first task of the novice teacher is to form an understanding of oneself as a teacher, to create one’s professional knowledge of self (Kagan, 1992).
According to Eisenschmidt’s research most attention is concentrated on the formation of professional competencies, which are essential in order to cope in the classroom. First, novice teachers adapt to their new organisation and colleagues and start acting according to their school culture. Later they begin to realize their personal development – the development of self-consciousness and self-conception, one part of which is certainly connected to one’s profession.

The monitoring of the induction year gives an overview of novice teachers’ self-beliefs, their professional development and cooperation, learning inside an organisation and cooperation with a mentor. Based on the results of the monitoring, proposals are made for changes in initial teacher education, the implementation of the induction year and continuous in-service training.

The study of Poom-Valickis (2007) provides grounds to believe that the growth of experiences during the induction year also leads to the growth of teaching skills of the novices, while increased competence and coping as a teacher in turn positively relates to the self-efficacy beliefs.

2. Method

The aim of the current study is to find out novice teachers’ main problems and their success experience; how they evaluate their acquired pedagogical knowledge; and to what extent they have applied this knowledge in their first two working years. The research method used is a written structured interview. Based on the interviews with graduates of the year 2008 and 2009 of Haapsalu College it will be found out what kind of ‘bottlenecks’ exist in initial teacher education and what kind of changes are needed in the training of teachers.

The participants in the survey answered the following questions:

*How have you managed in the first working years at school?*
*What have you succeeded in? Why?*
*What has caused problems? Why?*
*What do you lack as a novice teacher? Why?*
*How has the knowledge acquired in initial teacher training supported you in your practical work?*

2.1. Data collection and sample description

The research was carried out among the graduates of Haapsalu College who finished university in 2008 and 2009. The survey was conducted in May 2010. The research method used was a written structured interview.

The participants in the survey were sent an email with the above-mentioned questions and were asked to reply within one month. Altogether 15 emails were sent out, to which 11 novice teachers replied (4 first-year and 7 second-year novice teachers). Such a small number of respondents was not expected by the researchers. The reason for low participation might have been the end of the school year (heavy workload), which is the busiest and most stressful time of the year.
In order to ensure the anonymity of the respondents, the answers given were encoded and numbered.

2.2. Data analysis

In order to find out research results an inductive grounded method was used. Eisenschmidt’s frame (2006) was used as the basis for the analysis. Texts were encoded according to the model and were divided into three groups (professional, personal and social dimension). The same model has also been the basis for novice teachers’ development in previous studies (Eisenschmidt et al., 2010).

3. Research Results

3.1. Social dimension

Most answers given by the novice teachers were connected with the social dimension, although there was no specific question about that. All respondents valued good relations:

a) with students:

b) with colleagues:

c) with parents:

The respondents valued communication with their pupils most. They were pleased with the fact that pupils accepted them as novice teachers and that they managed to create good relations with them.

- *I am alive and have good relations with pupils, I matter to them.* (Tiina)
- *I have managed very well, I haven’t had any quarrels with my pupils, I want to continue with my work as a teacher* (Eha)
- *I managed to get good contact with my pupils, they accept me as a teacher.* (Krista)

Novice teachers are concerned about whether their pupils take them seriously enough. They would rather be friendly than demanding. When problems arise they try to find constructive solutions together with their pupils.

- *I get on very well with my pupils and as we have a friendly working mood in the classroom, we take each other’s interests into consideration and in case of problems we try to solve these in private. I have acquired knowledge about that from some lectures in the college, where we learnt about different management styles of a teacher, and from my master’s thesis, which gave me a lot of new ideas.* (Mare)

This example illustrates very well how the knowledge acquired at university was put into practice at school. Thus it may be concluded that in teacher education more attention should be turned to connecting theory with practice. It is important for a novice teacher to be able to reflect on the things learnt at university and to apply these in difficult real-life situations.

In conclusion it can be said that although the respondents emphasized good relations, they did not mention any essential or systematic cooperation with pupils. At the same time good relationships are the basis for successful cooperation and therefore should not be underestimated.

The support of one’s colleagues was another important factor pointed out. The fact that communication with colleagues was mentioned at all is very positive because
during their studies in the college students are told about the importance of community-based communication and mutual learning. The respondents value communication and exchange of experience both with their co-students, mentor and colleagues.

- My colleagues were really helpful and supporting. (Tiina)
- I have been well accepted by my colleagues. (Reet)

Novice teachers do not describe how exactly their colleagues support them. Probably they refer to common friendly relationships which are customary for a staff with high cooperation culture.

The support of the mentor is remarkable.
- Last year I had to deal with self-assertion as some of my pupils had different behaviour problems. But at the end of the school year I finally felt that I could assert myself as a teacher. I was no longer a ‘greenhorn’. In the second year my cooperation with pupils was more pleasant, but still at times I had to ask my mentor for advice about unexpected incidents. (Katrin)

It may be concluded from this that novice teachers do not deny having problems in the first working year; they try to find solutions and ask their mentors for help; and get some success experience to continue their work as teachers.

The support of the induction year programme is also acknowledged.
- During the first year I got support from the induction year programme which gave me a chance to exchange my experience with other novice teachers and to share different methods with each other. (Ülle)
- It was great to meet other novice teachers and to share our experiences, to talk about problems, in case there were any, and to find solutions to these. (Reet)
- For me it was very important to have a mentor, who introduced me to school rules / principles and to the responsibility accompanying school traditions. (Triinu)
- Luckily I had a mentor who helped me to find my place among my new colleagues.

These statements of novice teachers confirm the need for the induction year programme and especially the need for a mentor. Induction year monitoring also confirms the role of a mentor as ‘a local guide’, who above all helps a novice teacher adjust in the new school environment.

Communication with parents was mentioned less frequently and only by those teachers who have worked at school for two years.
- I have a good ‘click’ with the parents. (Ivi)

It can be concluded from this that novice teachers do not turn much attention to the relationship with parents. They understand the importance of communication with parents, but it is not their priority.

On the negative side the relations with colleagues were mentioned: I felt ill at ease because of the colleagues who wanted to take advantage of me as a novice teacher and wanted to give me assignments they did not want to do themselves. (Ülle)

In the support of novice teachers one of the first important steps is to create collegial relations, which promote cooperation between teachers. The novice teachers who participated in the survey did not really mention the word ‘cooperation’ but instead pointed out good relations with their colleagues.
3.2. Professional dimension

The respondents´ evaluation of their coping in the professional dimension was quite positive. Attention was paid to almost every professional competence, especially lesson planning and motivating.

Examples about lesson planning: *I had no difficulties working with pupils and conducting my lessons. I have had an excellent preparation.* (Tiina) Therefore it can be concluded that the knowledge and skills acquired at university have supported novice teachers and have given them confidence in planning their lessons. Feedback also plays an important role. After conducting a sample lesson, the students of Haapsalu College get feedback both from the lecturers of didactics and practice supervisors. All three parties (student, lecturer, practice supervisor) find some time to give constructive feedback and reflect upon their experience. The number of students in Haapsalu College is rather small, therefore it is possible to deal with each student individually, taking into consideration and developing his / her strengths and weaknesses.

Examples about conducting lessons: *For me the most important thing is to create a pleasant learning environment for pupils (pupils want to come to school and are motivated to learn).* (Reet) While conducting their lessons, novice teachers rely on the constructivist learning theory, in which pupils and their motivation are considered very important. In Haapsalu College it is emphasized that teachers should view each learner as a unique individual, therefore student-centred teaching is promoted throughout the studies.

Examples about the use of study materials: *I got help from my lecture notes of subject didactics. I use different extra assignments and methods and make changes in these according to the need.* (Veiko) The study confirmed that novice teachers have received great support from the didactics-related knowledge acquired in the university. Their lectures of didactics provide variety and are connected to practice. As study groups in the college are quite small, all the students get a chance to conduct different parts of a lesson and try out different methods, after which they are given feedback by their lecturers and co-students.

Examples about the importance of self-analysis: *Self-analysis is important for me. Especially in the first year I analysed every lesson (in a different notebook). I got the skill of analysis from the university. Although I´ve only recently started to fully realise what’s going on in the classroom. You cannot learn that in theory, you need practice.* (Reet) Analysing one´s activities is essential, especially for a novice teacher. First skills of self-analysis are acquired at university and will be very useful for novice teachers later in their work at school.

Examples about different problems: *I had problems with keeping order ..*(Anne). *There was constantly someone who I had to discipline ...*(Krista) *In the boys´ class I feel that I have a lack of knowledge about gender-based teaching ...* (Triinu) *I have problems with compiling and filling in different documents (class journal, work plans).* (Veiko)

The knowledge acquired during the studies at university supports novice teachers in their professional work, where it is important to rely on didactical materials, to analyse one´s work and to motivate pupils.
- For me it is most important to create a favourable learning environment for my pupils and I have succeeded in this. My first-graders want to come to school (their behaviour and words prove that, together with the feedback from their parents) and are motivated to learn. I am very grateful for the knowledge acquired at university as the topic of motivation was discussed in almost every lecture. (Ivi)

Although novice teachers did not have problems with preparing and conducting lessons, they experienced a lack of simple practical skills, like filling in school documentation.

- My biggest concern was how to use the e-school because the system itself was completely new to me and therefore complicated (though manageable in the end).

Different study materials (educational games, worksheets, field trips, observations, etc.) created in lectures of subject didactics have given novice teachers courage and self-confidence to plan and conduct their lessons. Contrary to the previous study (Eisenschmidt, Kasesalu, Löfström & Anspal 2009), where students were concerned about if and how they would cope with the teacher’s profession, the current research showed that novice teachers cope well with preparing and conducting lessons. Skillful planning of lessons has excluded discipline problems, which are feared most by novice teachers.

Contrary to Poom-Valickis´ study (2007) where it came out that self-reflexion needs more attention, the current study showed that self-reflexion is a habitual activity for novice teachers.

### 3.3. Personal dimension

The personal dimension is connected to the personal development of novice teachers. The novice teachers who participated in the study predominantly feel good and are pleased with their profession.

For example: *I am extremely happy with my choice* ... (Triinu) *I feel good and secure, I have managed well* ... (Veiko) *I do not regret my choice of profession till now, I am very pleased.* (Eha)

The reasons for novice teachers´ contentment might be connected to the experience they have acquired during their studies at university, observation and main school practice. Their positivism might be caused by the culture of the school where the novice teacher has been well accepted and supported.

For example: *I have completely blended into the teaching staff; my ideas and proposals are taken into consideration.* (Krista)

Half of the participants mentioned difficulties and high workload, although it was not specified what exactly was difficult.

For example: *Extremely exciting, at the same time it was the hardest time (had to get used to the new system and changes)* ... (Ülle) *Arduous, I had to assert myself. Looking at the workload, I can be pleased with myself.* (Anne)

Graduating from university and starting work as a teacher naturally bring about big changes as novice teachers have to learn to manage their time, plan and conduct their lessons and assert themselves as teachers.
Inconsistency was pointed out as one problem. For example: You have to be consistent. Consistency should be there both in the learning process and in demanding discipline. (Veiko)
- I have to assert myself more clearly. I am not very consistent in my demands. (Mare)
The respondents admit that they lack experience. At the same time they understand that experience comes in years of practice and it is not possible to learn everything at university.
- The knowledge acquired at university is really great. But after becoming a teacher I have finally started to realize that what happens in the classroom cannot be taught at university. Life teaches us. (Krista)

Novice teachers should be aware of the fact that when they start work, they need to adjust to different new situations and changes, which can be hard. Though some difficulties and high workload were mentioned by the respondents, there was also joy and assurance about the chosen profession.

In general the respondents sound positive and optimistic. They emphasize that they are satisfied with their profession, work environment and results.

Ideas for implications
As a result of the current study the strengths of the class teacher’s curriculum (good professional preparation, especially lectures of didactics and workshops) of Haapsalu College of Tallinn University were confirmed. The studies in the college are tightly connected to pedagogical practice in comprehensive schools, where students are guided by practice supervisors who have obtained special training. One of the strengths of the curriculum is also the students’ reflexion skill, which might be due to the fact that study groups are small and the lecturers / supervisors are able to provide thorough feedback to each student.

Although novice teachers consider it important to create good relations with their colleagues, they also see their role in participating in the school development (the development of the school curriculum, the compilation of syllabi and teachers’ work plans). Therefore the main objectives and study results of the class teacher’s curriculum in Haapsalu College of Tallinn University need to be amended so that they would stress the teacher’s ability to participate in the designing of development plans and school curricula and in the promoting of educational life both in and outside school.

Based on the conducted study, it should be mentioned that from the point of view of the curriculum it is essential to turn more attention to the consideration of special needs and gender-based peculiarities of learners. In cooperation with practice schools more attention should also be turned to the introduction and filling in of school documentation.

In conclusion, the present study gave an overview of the strengths and shortages of the graduates of Haapsalu College in their first working year(s). In order to conduct exhaustive research, more thorough interviews should be carried out, which would give detailed information for the development of the curriculum in Haapsalu College of Tallinn University.
References


