

SEARCHING FOR CONSTANT INNOVATION IN TEACHER EDUCATION CURRICULA: THE CASE OF ESTONIA

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Abstract

The study addresses the tensions between the aims and objectives of global, national and local curricula and suggests solutions for mitigating these conflicts using the experience of Estonia as an example. In spite of the success of recent reforms and the good results of students in international comparisons, there are serious deficiencies: an Estonian teacher's readiness to use professional freedom is modest, personal efficiency, job satisfaction, and students' motivation to learn is low: there are few outstanding performers. The aim of the study is to propose and analyse a teacher education curriculum innovation model for overcoming the problem. Adaptive model for curriculum design is presented where the predominant outcome-oriented approach was replaced and focus on teaching and learning processes was highlighted, the logic of design in curriculum development was implemented. A model for the practice component of teacher education, based on Wenger's situated learning model and Engeström's expansive learning model, is in the focus. It is found that implementing this approach could encourage a development of standards and transform the attitudes of both students and teachers towards increased creativity and professional development. The implementation of the described curriculum innovation model enhances new type of learning and can generate new modules in teacher education curricula.

Key words: *adaptive competence, curriculum design, Estonian education, practice in teacher education.*

Introduction

Curricula operate simultaneously at different levels of all education systems: at a global level (for example, global standards for reading, mathematics and science literacy), a regional level (for example, European Union standards and frameworks), a national (national curricula), and local school, classroom and individual levels. Historically, in Estonia as elsewhere, school, classroom and individual curricula were applied within the framework of a national curriculum but nowadays the influence of global standards and conceptual models is increasing. The European curricula, especially of the EU (European Union) countries, are directed by EU strategies, regulations and standards etc. This has introduced complex problems of sovereignty, autonomy, identity and agency. From the point of view of identity politics, the curriculum could be understood 1) as a cultural matrix and a substantial repertoire of possible identities and 2) as a resource (knowledge claims, thought systems etc.) for identity construction and as a shared symbolic territory for testing identities.

Since the early 1990s, "globalization" has been postulated as the dominant factor in modern social development. Diverse interpretations of globalization are important for education. According to R. Robertson (1995), there are two main contestants in the globalization debate:

(a) "Homogeneity proponents" who tend to look primarily at the presence of the universal (commodification, time-space compression, etc.) at a particular level (local, national) and accept a convergent scenario of development

(b) “Heterogeneity proponents” who tend to repudiate the universal and see the dominance of the West over the “rest” as that of one particular over others. The first interpretation logically prefers a cosmopolitan identity and global citizenship while the second is more open to national, ethnic and other particular identities. According to Robertson: “globalization – in the broadest sense, the compression of the world – has involved, and increasingly involves, the creation and the incorporation of locality - processes which themselves largely shape in turn, the compression of the world as a whole... Hence, homogenization and heterogenization are complementary and interpenetrative simultaneous trends” (Robertson, 1995) and the term “glocalization” instead of “globalization” is justified. Consequently, there is local in the global and global in the local. Castells also stresses that people identify themselves primarily with their locality and that territorial identity is a fundamental anchor of belonging. According to him, there is a paradox: the more the world becomes global, the more people feel local (Castells, 2011). For curriculum policy, the interpretation given by Robertson and Castells is the most acceptable: it leaves more room for different “local” peculiarities (content, pedagogies etc.).

From the perspective of the Eastern and Central European countries, the situation is complicated. They have experienced dramatic changes in the recent past, including national emancipation movements, rejection of the Communist regime, democratization, transition from a planned to a market economy and the modernization of social norms, values and lifestyles. Most of these countries became full members of the EU during a period of enlargement (2004–2007). But they have also had to cope with their historical legacies: belated modernization, nationalism, the traumatic memory of the totalitarian regimes. The historical development of the region was characterized by a lack of continuity of nation-building; and there is, even today, a need to re-affirm and celebrate national identity, to re-invent national symbols and create new ones. These processes often come into conflict with external and internal pressure for the revision of ethnically defined national identities (Törnquist-Plewa & Stala, 2011). In addition, the information age is anchored in a dynamic contradiction between the Internet and the Self as organizing principles of the new historical landscape. These circumstances make the condition of the newly emergent nations even more unstable (Castells, 2011).

Even though today’s Estonia no longer has an urgent need to catch up with the more developed countries of the world - it ranked 34th among 187 countries in the United Nations Development Programme Human Development Index (UN HDI) in 2011 (Human, 2011), we face pressure for development and standardization. But, as a very small country (1.3 million population in 2010), Estonia is extremely sensitive to the external pressures of global politics, standards, financial and intellectual assistance etc. The developing teacher education under EU requirements is no exception. Thus the aim of the study is to propose and analyse a curriculum innovation model for overcoming possible simplified standardisation and external control. Adaptive model for curriculum design is presented based on Wenger’s situated learning model and Engeström’s expansive learning model. The model can be used as an example of teacher education curriculum innovation process.

Estonian Context

Estonians have spent much of their history since the 13th century under foreign rule and have come to view education as a vehicle to a better future. This view applied after 1991 during the “shock therapy” period of transition to a liberal market economy after Estonia regained its independence from the Soviet Union. Available data on Estonian education demonstrate that the curriculum and other educational reforms have been relatively successful. Research on pre-school education (Tuul et al., 2011) established that teachers understand and evaluate positively the broadened conceptual framework of the new curriculum and the greater freedom and autonomy it offers them. Preschool teachers, however, expressed a need for further assistance in managing their new-found autonomy and the greater individual responsibility imposed on them by the curriculum

The data regarding general education demonstrate that the learning results of lower secondary students are remarkably good. Estonian students have performed very well in international comparative studies at this level – in the International Association for the Evaluation of Educational Achievement (IEA) *Trends in International Mathematics and Science Study* (TIMSS) 2003, in the Organisation for the Economic Co-operation and Development (OECD) Programme for International Student Assessment (PISA) 2006 (science-focussed) 2009 (reading literacy focussed). In TIMSS 2003 (Henno, 2010), Estonia was among the top performers, ranking in 5th place in science and in 8th place in mathematics. Most importantly, 99% of students were above the lowest proficiency level in science and 97% were above the lowest proficiency level in mathematics. In PISA 2006, Estonia ranked 5th in science, 13th in reading and 14th in mathematics (OECD, 2007). The number of students at a very low proficiency level was minimal. In PISA 2009 (OECD, 2010), Estonia ranked 13th on the overall reading scale, 14th on the mathematics scale and 5th on the science scale, and occupied 3rd place in the index of online reading activities. The share of students who performed below the baseline level of proficiency was significantly below the OECD average. Evidently, Estonian 15 year-old students do exceedingly well.

But there are alarm signals. The share of students, who attained the highest proficiency levels, was modest in all the above mentioned international studies. A more detailed analysis of the Estonian results (Henno, 2010) revealed that, according to the TIMSS 2003 data, Estonian students do not like science studies, their self-efficacy indicators in relation to science learning are modest and teachers' satisfaction with their work is low. PISA 2009 proved that more than 1/3 of Estonian students do not read for enjoyment and the share of those who read fiction for enjoyment is significantly below the OECD average. According to recent state final exams, sharp differences between different schools have been established. In addition, a representative study of students' (Ruus et al., 2007) established heavy learning overload and chronic fatigue (reported by 2/3 of respondents), unhealthy habits (about 1/4); a dislike of school attendance (about 1/3), psychological disposition for violent behaviour (about 2/3), prevalent use of unconstructive coping strategies, low trust and sympathy towards teachers (about 1/3 of the students reported that there was not one trustworthy teacher at their school). Almost one half of students (especially boys) see their school as out-of-date. Most students find that their school strongly prioritizes academic outcomes over human values. It must be stressed that the value spectrum - narrow or broad - was the main factor that made significant differences between schools. Also, OECD Teaching and Learning International Survey (TALIS) (OECD 2009) data refer to some dangerous factors. TALIS established that Estonian lower secondary teachers are predominantly female, well educated, disciplined, have progressive educational beliefs, are strong in classroom management and keeping students on task, but, alas, they are relatively aged, their teaching practices are quite traditional, they have distant relationships with students and their job satisfaction and self-efficacy indicators are low.

The developments of Estonian higher education (including teacher education) have been strongly influenced by the Bologna policies: the three cycle degree system has been implemented, outcome-based curricula have been introduced system wide, qualification assurance mechanisms and corresponding institutions have been established. Certainly the Estonian higher education institutions now belong to the European Higher Education Area as ordinary, regular members.

Today the "romantic", enthusiastic period of state and education building has been left behind and the Estonian education system as a whole has undergone a profound restructuring. Alas, in parallel with these positive shifts, some new threats are emerging. Strong regulation and accountability mechanisms have reduced non-instrumental, non-commercial educational aspirations and the intrinsic learning motivation of learners and teachers. Today, structures tend to prevail over agency, external control and management over self-control and self-determination, formalisms and standardization over innovation. The creative spirit and commitment to the emancipatory ideals is gradually vanishing. These are warning signs of the predominance of instrumentality. Once permanent, these trends very likely lead to stagnation.

In order to make curricula more adaptive to the emerging needs and challenges, some theoretical ideas are presented in the following section.

Searching for Innovative Curricula

Curriculum operates as one of the most important tools for building education as a system. Of course, this potential could be realized only on the condition that the educational agents, especially students and teachers, share the curricular values and principles.

At this present time, most countries worldwide, including Estonia, shares an understanding that the basic building blocks of modern curricula must be learning outcomes. But, as testified by the experts, this is “an element that is at once the most radical and the least understood” (Sursock et al., 2010). Hence, in order to handle curricular processes, conceptualization of learning outcomes is crucial.

Estonia introduced an outcome-oriented approach at the beginning of the 1990s, while developing the national curriculum for general education. Outcomes were then understood as competencies. The concept of competencies was inspired by the generative grammar worked out by N. Chomsky. More exactly, he claimed that a limited set of rules can explain the ability of a hearer-speaker to produce and interpret an infinite number of utterances, including novel ones (Chomsky, 1965). This model accounts for the productivity and creativity of language. Especially because of this feature, this approach has great potential for education. B. Bernstein briefly analyzed the linguistic competence introduced by Chomsky as well as the cognitive (Piaget), cultural (Levi-Strauss), the communicative competence (Dell Hymes) and their practical accomplishments (Garfinkle). He concluded that, especially in turbulent times when it is difficult to predict future events, competence theories have emancipatory potential because there is “an in-built procedural democracy, in-built creativity and in-built virtuous self-regulation” in these theories (Bernstein, 2005).

So far, the Estonian curricula for general education have shared this approach to competencies. Therefore, the curriculum of 1996 viewed competencies as a type of readiness of an actor (compare a set of rules in the deep structure) to operate (compare utterances in surface structure) in accordance with his needs, goals, socio-cultural norms and given circumstances. We especially want to underline the creative aspects of this model and the vision that there is potential for an unlimited variety of “right” (and also “wrong”) “answers”, i.e. - behavioural acts.

However, during the last decade the meaning of competence has shifted towards the performance model, especially in vocational and higher education (including teacher education). Clearly, the outcome-based curricula are more prescriptive and have an explicit behaviourist character. The indicators of prescribed outcomes tend to be “mechanistic”, solidly formalized, meticulously graded, insulated, fragmented, and entered as particulars. As a whole, the outcome-based curricula tend to be loosely connected with the goals of personal, professional and citizenship development of students. Surely, the warnings of the Bologna process promoters and analysts that “... all Bologna Process partners should be aware of the risk of slipping into technical and technocratic discourse at the policy level” (Trends, 2010) is of great concern to Estonia. We also foresee an undesirable development that “the Bologna Process can be read as a rational program that tends to create a discourse for the governing of self in light of the objectives already set by which a new pedagogical regime is establishing itself” (Karseth, 2006). As a result, such educational conditions have the potential to repress students’ and teachers’ initiative, autonomy and sense of authorship in their learning and teaching processes. “In the world of values defined by the curriculum, it is possible for the teacher to act without knowing her/his own ground for thinking and acting (Kansanen et al., 2000)”. This observation applies to students as well.

Thus, a paradigm shift in the domain of curriculum development is necessary. Firstly, we must not restrict ourselves to the so-called outcomes based approach. At the very least, it is necessary to restore a more systemic and integral input-process-output thinking. Secondly, we

have to implement a more liberal and flexible interpretation of standards; we have to avoid the narrow understanding of standards as pre-planned and prescribed performances and leave more room for unexpected results, for going beyond standards and overcoming rigid preset frameworks and providing more room for innovations. This idea is related to the popular concept of creativity in educational practice. Thirdly, in addition to the prevailing focus on outcomes (and on inputs as well, from time to time) we must restore the status of fundamental education processes, that is learning, and also of course, teaching. Results, products, innovation do not depend directly on formalized, standardized, and prescribed outcomes, but first of all on productive processes. They are influenced by previously achieved outcomes, behaviours, habits, cultural norms and stereotypes, but they are also affected by the actors' future goals. We note that since the late of 1980s, there has been an influential process orientation or "process view" in the business domain. (Hammer, 1996; Becker et al., 2003). Adoption of this view has demonstrated its usefulness for the overall performance, the positive corporate climate of business organizations and for customer satisfaction. Also dynamic innovation models place emphasis on processes and promote self-organization instead of adopting strict measures that are strongly oriented to results (Schienstock, 2007). In general, the need of positive social adjustment to a contemporary turbulent environment presumes collective learning processes in parallel with structural changes (Heiskala, 2007). Education cannot be an exception.

The first pre-condition for this developmental path-change is restoring a holistic, system-based approach and understanding curriculum as an artefact, as a design that has been produced by human designing activities.

The Process of Innovative Curriculum Design

An overview of the subject indexes of curricular literature shows that the entry "design" is often absent, or, when present, usually lacks any conceptual or terminological status. There are, however, exceptions. For instance, H. Taba (1962) defines curriculum design as "a statement which identifies the elements of the curriculum, states what their relationships are to each other, and indicates the principles of organization and the requirements of that organization for the administrative conditions under which it is to operate". P. Hlebowitsh (2010) identifies curriculum as "a series of activities in which students engage with subject matter" and adds: "Because everything cannot be studied at once, these activities must be orchestrated some way. This arrangement is called curriculum design". So, design in curriculum is above all seen as a construction or as architecture. There are also some typologies of the curriculum design. For example Hlebowitsh (2010) differentiates between the following design types: those that are based on school subjects, those which proceed from their social or personal relevance, and those that are oriented towards the intellectual development of learners. Pinar and others (2004) refer to the classification of curriculum designs introduced by J. G. Saylor, W. Alexander and A. Lewis in 1981. According to the authors the following design types exist: subject matter or disciplines, specific competencies/technology, human traits/processes, social functions/activities, individual needs and interests/activities. These types define the usual ways to organize instruction: (1) by disciplines, or (2) through instructional designs (for example, learning modules), or (3) through planned processes (for example, values clarification exercises), or (4) through community activities (for example "get out the vote" campaign) or (5) through independent learning activities (for example, learning to paint). The last two could also be organized through disciplines, modules or planned processes. These examples demonstrate that a design approach can be fruitful for the description of the main characteristic features of a curriculum.

Seeing curriculum as a design opens up interesting parallels and further generalisations. By its inner logic the curriculum as an artefact, as a design oriented towards creating something new and hopefully better resembles buildings, films, computer programs, commodities, works of art etc. Frederick P. Brooks, a computer scientist, understands design as a plan as well as its later execution. Hence, a design has three successive phases that operate recursively (Brooks, 2010):

1) The formulation of the conceptual constructs (of a book, or a computer program etc.): an opus, a product firstly comes into existence as an ideal construct, as an Idea, as an invisible entity),

2) Articulation, writing, realization, “working out” (for instance an opera idea with pen on paper),

3) Interactivity with users in real uses: someone uses the opus, the product (reads the book, uses the computer, interprets an opera Idea with orchestra and singers and interacts with the audience).

In the context of the curriculum, the logic of the design process is relevant. There is a widely used orderly model for the design process, that starts with defining a primary goal, next describing secondary objectives/desiderata/requirements, then identifying constraints and resource allocations and finally, making the design decision (mostly presented as a tree-structured design space). This is linear, pictorial, simple, unambiguous, and easily understandable process. Because of these qualities, this model it is quite suitable for signing contracts, keeping designers accountable and controlling the design process and its outcomes. But, as stated by Brooks, this model does not work in real life, in spite of its logical perfection. According to him, in reality we don't really know the goal when we start, we usually don't know the design tree, but discover it as we go, the nodes in the design tree are really not design decisions, but tentative complete designs, the goodness function cannot be evaluated incrementally, the desiderata or objectives and constraints keep changing, they shift and refine (Brooks, 2010). Additionally, this does not reflect the creative practice of professional designers and mostly neglects the distinctiveness of design reasoning. Brooks agrees with D. Schön's critique of the model and quotes his judgment, that “...The model of Technical Rationality... fails to account for practical competence in “divergent” situations... and can be applied only to well-formed problems already extracted from situations of practice” (ibid).

Indeed, educational problems, including curricular issues, are mostly “wicked” problems: incomplete, contradictory and involve changing requirements, complex interdependencies and different world views of stakeholders. Their solutions depend on how a problem is framed and there are no a priori true-or-false solutions, only better or worse (Wicked, 2011). Pedagogical designs are never finished and need to be worked out again and again (Ellsworth, 2011). Thus, the linear model of outcome-based curriculum design is too simplified, sometimes even counterproductive (especially when implemented in higher education which puts high value on unexpected results and originality because of its historical legacy). Tackling this complexity requires fruitful exchange of different viewpoints, experimental and interpretative approaches and human-centred design thinking.

A Model of Practice in Teacher Education: A Prototype of Innovative Curriculum Design

The problem of learning and integrity of theoretical studies and practice has become more and more important in teacher education. Teachers' preparation for practical work at school and their necessary competencies have been increasingly stressed, both in the European Union documents of teacher professionalism and teacher policy, as well as in the corresponding academic research. Therefore, workplace learning is more in focus. This type of learning is situated in the area of contact and interface between different individuals (the student teacher, university supervisor, school teacher) and collective actors (the school and university). The wider context of their activities is mostly determined by the relevant socio-cultural expectations (norms, regulations, standards) and systemic demands (the position of practice in teacher education) and educational needs of school children and youth. From the perspective of a student teacher, the school practice takes place in a border zone: she/he is still a university student and at the same time an actual teacher in real school life – a person who is placed in between the institutional borderlines and crosses back and forth from one institution to the other.

The pre - service teacher must interact with new people and perform and participate in activities which he/she could only imagine theoretically during university studies, or at best, try them out in simulated conditions, that is - not in authentic situations. Therefore, from a student teacher's perspective, it is appropriate to model learning during practice through the conceptual means of situational activity and to describe learning as a developing human activity (Lave, 2009) and social activity (Wenger, 2009). E. Wenger (2009) uses the following postulates in his further elaborated original model (1998) of social learning: (1) man is a social being, (2) knowledge is a matter of competence as an ability to do something valuable (finish some product, or other task), (3) becoming knowledgeable pre-supposes active participation in a social community of practice, the feeling of belonging and constructing one's own identity with respect to these communities and (4) knowledge includes giving meaning to one's own experience and life in general.

According to Wenger, social learning requires the existence of four dimensions:

- 1) Community – learning as belonging: belonging to a social community in which our activities are recognized as valuable and competent;
- 2) Practice - learning as doing: joint action relying on common (shared) historical and social resources, background systems, and viewpoints;
- 3) Meaning - learning as experiencing: an ability to experience one's life and the surrounding world as meaningful;
- 4) Identity - learning as is becoming (someone): an understanding of how learning, in the context of the community, affects and moulds us (Wenger, 1998).

According to Wenger, the critical point of learning is social participation (Wenger, 2009) or, as stated by Lave (2009), switching to situational activity. This may not go smoothly. People are positioned differently within the situation, in existing power hierarchies; people have different motives and aims, different experiences and previous knowledge; they care about different things. When the situation is totally new for the student teacher, when he/she is not accepted by the community and access to current practice activity patterns are withheld, the learning process may fail and non-learning, or even wrong learning, may take place.

Regrettably, the practice component in teacher education has rarely been contrasted with the different models of workplace practice in vocational education, although several common problems can be observed. People in teacher education, as well as vocational education, complain about the lack of the necessary connection between theory and practice, about the vague objectives of practice; they complain that people don't learn much during practice and that cooperation is weak between the different parties involved in the practice.

D. Guile and T. Griffiths (2001) having analysed the practice models give preference to the connective model, which first and foremost gives importance to reflectivity, questioning the practice experiences, critically analysing these and elaborating new activity models during practice. The roots of the connective model emanate from the cultural-historical activity theory of L. Vygotski and is further developed and modified by Y. Engeström (1987, 2001, 2009). He interpreted school and work as two different activity systems each having their own history, actors, rules, division of labour, mediating artefacts (signs and tools) and objects. When there is a situation where two or more activity systems interact, the developmental transfer of knowledge can take place and the possibilities to develop activity systems will unfold. According to Engeström, developmental knowledge transfer means expansive learning, which begins with questioning an existing practice, followed by analysis, modelling the recommended (future) practice, testing and applying the model, extending it to different organizations and finally, assessment. Construction of the so called border object and transfer of knowledge between different systems of activity, constructing new practices, concepts and theories all occur during expansive learning. Engeström claims that expansive learning also includes most of the known learning theories and approaches – cognitive, reflective, situational, social and transformative. Engeström argues that collective systems of activity, by being in mutual interaction, raise contradictions, i.e. structural tensions within and between activity systems that “generate disturbances and conflicts, but also innovative attempts to change the activity” (Engeström, 2009).

The pre-service teacher is moving from one system of activity (in our example, the university) to another (in our case, the school) and as a reflexive learner is capable of overcoming the boundaries of the two systems of activity, connecting them into a single entity at a higher level. It must be argued that the connective model, placing student teachers in the role of border crossers, supports their development as workers with poly-contextual skills. Student teachers are working/studying “in the nearest development zone”, which creates the best conditions for self-organization and cultural development. The connective model, in order to separate effective learning within work from the everyday routine and narrow frames limited by the situation, recognizes the importance of formal education and is actually interested in knowledge between school and work (Tuomi-Gröhn & Engeström, 2003).

Engeström’s expansive learning theory, as a large scale “grand” theory, embraces the social learning concepts elaborated by Lave and Wenger. He acknowledges their idea about the “legitimate peripheral participation” (Lave & Wenger, 1991) and recognises their position that “motivation to learn stems from participation in culturally valued collaborative practices in which something useful is produced” as “a satisfactory starting point when we look at novices gradually gaining competence in relatively stable practices” (Engeström, 2009). This is exactly the case with the student teacher in the practice situation.

The qualitative empirical research (Timoštšuk & Ugaste, 2010; Timoštšuk, 2011) on the development of professional identity in Estonian teacher-education students during their school practice revealed that there were only a few cases when the students felt they belonged to the teaching community and they did not see themselves as team players in the context of their relationship with the University. Since a sense of belonging is the main feature of community, one can conclude that no teaching community emerged during school practice. Also, learning as doing was rarely mentioned by the students and when it was mentioned, it was mainly in the context of giving lessons without personal or theoretical interpretation. The most frequent self-descriptions of students about meaningful experiences received during their practice were emotionally coloured, while negative emotions (dissatisfaction, disappointment, irritation and several others) prevailed and were often directed at the students’ school teachers and university supervisors. According to the students’ self-reports, positive emotions (enjoyment, satisfaction, etc.) were mostly connected with the successful results and friendly attitudes of the schoolchildren. Deducing from this evidence, we find that the practice component in the Estonian teacher education mostly resembles the traditional practice model.

The problem of orienting practice more systematically to expansive learning and to the development of adaptive expertise of students persists. In our opinion, the key is design thinking – deliberate implementation of collaborative design where all parties - the student teacher, university supervisor, school teacher, schoolchildren, and occasionally persons outside of the school environment (parents, specialists, politicians etc), actively participate, plan and conduct teaching and learning.

The basic logic of design process is quite simple: to detect a real life problem, a substantial or crucial educational need, and construct a design or designs as a tentative solution or alternative solution for the problem. This means actually creating a quasi-experimental situation with (optimal) participation from all partners.

The first step is defining a vital educational need in a real life context (foremost school-life) and questioning the current practices, behaviours, routines, etc., Observations, discussions, presenting arguments, interviews, questionnaires – all these and other relevant tools are potentially useful; the choice between them depends on the special case and context. The second step: the team, its individual members or their subgroups, envisage the features of the future design and represent this mental image in some form – visual, verbal, hybrid and mixed modes.

During these two phases, a border object is constructed, appropriate (quasi) concepts and (root) metaphors are created, the shared language is elaborated, the first sketch or draft variants of the future design, and the contours of its architecture, are constructed and articulated.

Boundary Crossing as Learning Activity and as Curricular Aim

Everybody who has or has had some contact with pre-service and in-service teachers and university teachers can imagine that they speak different languages, use different concepts or misconceptions, have different personal theories, scientific explanations or tacit understandings concerning learning, teaching, schooling etc. Dialogue would not be possible if the central topics of the conversation were not identified. Scientific concepts/specified language in practise at university might support the content of the topic, but not necessarily, because everybody feels a need to speak “with one’s own words”, perhaps using idiomatic expressions, everyday phrases, metaphors, original neologisms. Also, some fresh information from different sources (books, multimedia, the internet and other sources) must be introduced in addition to the traditional knowledge gained from textbooks.

It is very likely that participants during these encounters will feel compelled to break free from their established perceptions and separate “worlds”, to cross over the borders of their everyday routines, ways of thinking or disciplinary limits and thus, some kind of a “local dialect” inside of the team will emerge. Designing new joint activities can be the first step. After making a design decision, the implementation phase in real school-life follows. This phase is the most critical, the ‘litmus test’, in order to know how the design actually works, which learning-teaching processes it triggers, inspires or hinders. This phase could be interpreted as the interaction of the designers’ team with the users, most importantly, with pupils, but there are also other interested players such as parents, student teacher’s colleagues at the school, co-students etc. Here two processes can be highlighted:

(a) The engagement of pupils in the process of the implementation of the design in the classroom or outside it, paying attention to their motivation, emotional reactions, whether they remain ‘on task’, their learning modes, cooperation with co-learners, and

(b) The assessment of pupil learning outcomes – the students’ successes and failures.

The evaluation of the design itself, an explanation of its effects, positive as well negative, follows. The university teachers’ professional competency in the exchange of theoretical knowledge, posing hypothetical explanations for the observed learning-teaching events etc., is especially valuable. Launching a systematic design research with participation of student teacher, university supervisor and school teacher is the next possible undertaking. For research universities and research-based teacher education, this phase seems unavoidable.

During all these activities, it is extremely important that all the participants share an understanding that they must work as a team in searching for solutions for the authentic and meaningful educational problems. Commitment, an open dialogue regime, mutual trust and respect, open-mindedness and reciprocity are obligatory pre-requisites for finding successful solutions. It is possible that in the course of time, educational design communities’ networks and clusters will emerge. It is not impossible that some kinds of meta-communities with distinctive organizational structure will take shape in the future.

Adopting this model assumes that the necessary resources - finances, time, information-are available and that there are also adequate institutional arrangements and regulations. One of the most important aspects is that the descriptions of design products, their interpretations, evaluations and explanations are saved and are retrievable “just in time”. That is – the relevant cultural memory (archives, repositories, catalogues etc.) must be deliberately created and maintained. This creates conditions for the continuous development of learning and teaching as a human activity system - as a specific cultural domain.

Looking at Estonian teacher education from this point of view, we note that there are already some sound premises on which to build this kind of learning and teaching culture.

In this context, the schools of professional development in teacher education should also be mentioned. There are cooperative activities between schools and (Tallinn) University: common in-service courses, planning and analysis of lessons supervision of teaching practice, etc. In order to develop the reflective skills and habits of student teachers, an e-portfolio as

well as personally oriented supervision sessions (often with co-students) has been introduced during school practice. In order to motivate students and to rouse their interest to explore and theoretically explain real school-life, the supervisors encourage students to connect their MA thesis with the problems they have noticed during practice. Sometimes border objects (often expressed as metaphors) have been created. Also, there are some cases when innovative initiatives have taken place. Recently, as a result of her teaching practice, one student teacher suggested making a school garden and initiated the first steps of this project.

Such innovations deserve further development and the relevant administrative and financial support. It must also be mentioned that robust discussions about establishing a Learning Science centre are underway in Tallinn University in order to make educational innovation and research more systematic and better coordinated.

Conclusions

Today, in parallel with the global and European mainstream trends, Estonian education has gained mostly an instrumental character. Now it is primarily governed by external standards and regulations and ruled by external control, accountability and test-focused mechanisms. These may ensure the attainment of mediocre results at the average level, but there are problems with higher order thinking, in-depth learning, creativity and excellence. In order to guarantee a pool of top performers, top thinkers, top artists and scientists, large countries can successfully apply selection mechanisms and competition. Estonia is too small to implement these measures. The one possible solution for meaningful innovation in education is curriculum design based on social learning theories. The cooperation, shared practices and responsibility should be in focus for teacher education and for general education also instead of standardized approach. Some characteristics of social learning (community formation, the actual practise of doing something useful, meaningful experience, and identity building) are evident in teacher education. There is hope that the active engagement of different participants in learning enhances curriculum design processes. Design processes make learning relevant to everybody and carry a strong motivational incentive for all involved in these activities. Collaboration between university and school teachers, teacher students and pupils, can bring their learning and every-day life closer, deepen mutual understanding and decrease the widening generation gap.

Creating an original design, actual teaching/learning as well as research (attempts to explore and explain the effects of design, evaluate its strengths and weaknesses) are interconnected and intertwined in a very natural way. It means that systematic design research could be deliberately practised in teacher education. Design research is a field with a great prospect. As F. M. Connelly and S. Xu (2008) underline that “we might think of a... dialectic movement toward interdependence of theory and practice. In the dialectic movement, practical starting points enlist theoretical frames and theoretical pursuits forge practical connections,” the design research could be one of the possible solutions.

The theoretical overview of curriculum design offers some answers to contemporary challenges in education:

1) Design processes at the grass roots level involving school teachers, pupils, university teachers students, and, if necessary, other interested parties can promote constant innovation in curricula;

2) Design processes could support the ownership of the curriculum by students and teachers, their sense of belonging to their local learning community, the meaningfulness of their everyday activities and anchor identities;

3) The design approach enhances opportunities for interconnecting and interweaving teaching-learning, innovation and research carried on by the school and university teachers as well as schoolchildren and university students, thereby enhancing their reflexivity.

Nevertheless, every new model (or initiative) in education, this approach also has its limitations and weaknesses. It is time consuming. There could be situations where so-called

“direct teaching” is necessary and strong support by the teacher in re-contextualization of “vertical knowledge structures” and its conceptual hierarchies is urgently needed. Thus, some issues for further research are emergent: what domains of curricula can be developed as a design process, how much time and other resources should be involved, and what role should policy makers play in this? The design research as a format of empirical study would be one possible way to search informed answers to these questions.

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