

**Crossing Boundaries
for Learning
– through Technology
and Human Efforts**

Crossing Boundaries for Learning – through Technology and Human Efforts

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Preface

TEPE is an academic network that promotes research- and evidence-based teacher education. The annual conference brings together educational researchers, policy makers, teachers and practitioners from Europe and beyond.

This book is based on selected papers presented in the annual conference of the Teacher Education Policy in Europe (TEPE) network in 2014 at the University of Helsinki. The title of the conference was **Learning Spaces with Technology for 21st Century Skills in Teaching and Teacher Education**. TEPE conferences also provide a space for more general themes of teaching and teacher education, in addition to the specific topic of the annual conference. In addition to technology-related themes, in this edition, there are also articles that describe human efforts to provide learning spaces for all.

All papers are blindly peer-reviewed. The editors wish to thank all the reviewers for their important work. They have given extremely valuable comments and advice to the authors. The TEPE Board and local conference organizers would also like to thank CICERO Learning Coordination for managing the review process. We wish to thank the University of Helsinki for providing support and space for the conference and to thank the Federation of Finnish Learned Societies for its financial support. We are also deeply thankful to Tekes, the national agency for technology and innovations in Finland, which has launched the Learning Solutions Programme and accepted the Finnable 2020 project as part of it. The TEPE conference was integrated into the project work of Finnable 2020 and also created an important platform for discussions regarding how to use technology as a tool for learning.

In Helsinki, March 20, 2014

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Prologue: Crossing Boundaries for Learning

Hannele Niemi, Jari Multisilta and Erika Löfström

The theme of the 2013 TEPE Conference was **Learning Spaces with Technology for 21st Century Skills in Teaching and Teacher education**. The motive behind the conference was that 21st century skills have become an urgent priority of educational systems all over the world. Changing environments, e.g., developing technological infrastructures, increasingly networked communities, and constant access to digital resources, have made 21st century skills more important than ever. There are several definitions (e.g. Ananiadou, & Claro, 2009; Binkley et al., 2012; Griffin, Care, & McGaw, 2012) of “21st century skills,” but all share common features. Learners require active inquiry skills, knowledge must be constructed and assessed, and learning environments are changing in a way that we cannot even forecast. In most cases, knowledge is created in groups, and learners learn from one another. Many prior boundaries between formal and non-formal learning sites are in the process of breaking down. Learning spaces are becoming more overlapping, seamless, joined, and blended. Learning continues throughout life, and a school’s task is to provide learners with the skills and competences with which they can continue their learning in different phases of their lives. Learners also require competences in terms of how to use learning environments that are nearly boundless and create knowledge that will become endlessly growing and up-dated. We know that innovations grow from collaboration and networking. The major message of the various definitions of “21st century skills” is that learners need new ways to think, learn and work. They must self-regulate their

own learning. They need collaborative skills and active knowledge creation competences. To support these skills and competences, both students and teachers are learners. Teacher education has a critical role in how these skills can be achieved.

It is not only the need for 21st skills but also emerging technologies that pose new challenges to schools and teachers. The younger generation is using technology outside school in its free time, but in many schools, the adoption of technologies is lagging. Technologies should be seen as tools to improve and mediate learning and the learning process. Digital literacy is one of the key competences needed for the future, and it is often listed among the 21st century skills. However, technologies can also support collaborative learning and knowledge creation, so technologies have a role as a tool for use with other 21st century skills as well. The adoption of new technologies for classroom use is not an easy task. This is why we need case descriptions of the best practices and the results from scientific research to help teachers develop their teaching methods and meet the challenges they face.

The Organizing Committee of the TEPE Network Conference 2013 invited papers that addressed the use of new technologies and the promotion of 21st century skills. The main themes of the call were as follows: New technologies in teaching, learning, and teacher education; Teachers' and students' 21st century skills; Promoting these skills in teacher education; and 21st century skills in educational policy. The TEPE annual meeting has always had also an option, in addition to the main conference theme, to provide space for presentations about more general, urgent themes of teaching and teacher education. As editors of this book, we realize how important it is to widen the scope to include a discussion of the need to provide learning spaces for all. Not all learning environments are technological, but students must still learn skills that will help them to face the future. Technology can be an important tool, but without other educationally supportive structures and equal opportunities for a good education, technology alone cannot solve problems or provide the necessary skills for the future. With these reflections, the editors titled the book as follows:

Crossing Boundaries for Learning – through Technology and Human Efforts.

In the introductory chapter, Hannele Niemi and Jari Multisilta introduce a framework for Global Sharing Pedagogy (GSP). The model takes as its point of departure the skills and competences required in working life and, more generally, in life-long learning. Many of the subsequent papers can be viewed in light of the mediating activities elemental to GSP, namely digital literacy, collaboration, networking, and knowledge and skills creation. These are the key activities in learning engagement, and ICT tools can be harnessed in many ways to support the development of these competencies. The authors provide an example from digital storytelling.

The papers in the first section explore how technology creates new practices in schools. Technology has been used to facilitate personalized learning and inclusion in science education, as well as in partnerships between schools, homes, and the wider community. In their paper “Crossing classroom boundaries in science teaching and learning through the use of smartphones,” Kati Sormunen, Jari Lavonen, and Kalle Juuti describe how everyday technology might be incorporated into science teaching in order to personalize the learning experience and engage pupils with science content. The authors identify the potential as well as challenges, including the pupils’ need for teacher prompts to activate learning. The findings emphasise the importance of supporting the development of pupils’ self-regulation skills in ICT-facilitated boundary-crossing learning activities.

Minna Kukkonen and Jari Lavonen describe a concrete example of school-community collaboration facilitated through ICT tools in their paper “Crossing classroom boundaries through the use of collaboration supporting ICT: A case study on school - kindergarten - library - senior home partnership”. The design-based research serves to show that the ICT tools, along with a sound model of collaboration, provide vast opportunities to involve pupils at school in activities closely intertwined with their community, while supporting the development of important skills, competences, and, perhaps most importantly, citizenship.

Similarly, schools and homes can also be perceived as forming partnerships. Tiina Korhonen’s and Jari Lavonen’s paper “Crossing school-family boundaries through the use of technology” provides ideas about how schools might actively develop their relationships with parents. Again, design-based research provides the model for exploring and developing

home-school collaboration through technology. The authors identify areas of communication and collaboration, on the one hand, and areas of support for learning, on the other hand, in which technology serves to mediate home-school involvement.

Part and parcel of teacher change agency is the teacher's familiarity with e-learning tools that can be harnessed to leverage change across teaching and learning and across different levels, i.e., the individual, school, and education system levels. In their paper "Teachers' capacity to change and the ICT environment: Insights from the ATEPIE Project", Jelena Radisic and Jasminka Marcovic explore teachers' conceptions of change agency in the Balkan region.

The papers in the second section explore how technology creates new practices in higher education. The new practices are here viewed in terms of the benefits and challenges related to the use of ICT in schools, a tool that promotes students' self-direction and reflection, and participation in various learning spaces. Two of the papers focus on the context of teacher education, which prepares teachers to work in increasingly complex societies, but also on the increasingly versatile teaching and learning tools at their disposal. Anne Huhtala's paper "Prospective teachers and new technologies: A study among student teachers" argues for the necessity of preparing future teachers to confidently utilize ICT tools in their teaching. It analyses student teachers' attitudes towards using ICT and identifies the benefits and challenges of ICT as envisioned by these prospective teachers.

The paper "E-Portfolio as a tool for guiding higher education student growth to entrepreneurship" by Tarja Römer-Paakkanen describes an effort to develop a portfolio and reflection tool for promoting entrepreneurship among students. The paper provides valuable insight into the development process of an e-tool for others who are interested in developing tools that foster students' self-directed learning and promote reflection, both of which are important 21st century skills and competences.

In her paper "Affordance as a key aspect in the creation of new learning" Susanne Dau explores the affordances of different learning spaces in blended learning environments in an attempt to understand what the driving forces behind students' learning are in these different spaces. With the increasing variety of learning spaces and platforms, there is still the

need to recognize how face-to-face spaces may contribute to the overall learning experience. By increasing our understanding of the affordances of different contexts and spaces and the roles that students take in these spaces, teacher educators can support the learning of prospective teachers. These student teachers will work with pupils who flexibly shift spaces and tools, and it will become more and more important for them to reflect on their learning experiences in order to understand the realities in which their future pupils navigate and learn.

In the third section, “Getting along with Different Learners”, the authors return to fundamental questions of education that are now ever so timely in our global community. The 21st century skills, such as information literacy, critical thinking, collaboration, and problem-solving are intertwined with the values and understandings of core competencies that future generations must be equipped with, but how do teachers and educators understand and approach democracy and values education? Through his paper “Conflicting ideas on democracy and values education in Swedish teacher education,” Björn Åstrand analyses this question through the Swedish case and reminds us of the historically and culturally rooted nature of education and education policy.

In the last paper, “Demands and challenges - Experiences of Ethiopian rural school teachers”, Kati Keski-Mäenpää provides a glimpse of another type of context, namely rural schools in Sub-Saharan Africa, where schools, teachers, students, and their families struggle with a broad range of severe challenges, not least of all poverty. This study reminds us that even though ICT tools offer great promise for learning in a wide variety of contexts, there are parts of the global community that lack the infrastructures and resources necessary to take advantage of these opportunities. However, the skills and competences necessary in these environments may not differ that greatly from what is termed 21st century skills, and democracy and values education is no less of an important question in these contexts. In our minds, this study raises questions about boundary crossing between developed and developing countries, as well as between school reality and policy making.

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Part I

Crossing Boundaries through Technology

1 Toward Global Sharing Pedagogy

Hannele Niemi and Jari Multisilta

Abstract

Learning and learning environments have changed, and are still continuously changing. Many changes are connected with information and communication technologies. In this article, we analyze changes in learning concepts and knowledge creation, and the types of skills that learners will need in the future. New requirements are examined from a working life perspective. On the basis of these changes, we introduce a new pedagogical concept for teaching and learning in schools; global sharing pedagogy (GSP). The aim is to engage students in learning through four mediators: (1) Learner-driven knowledge and skills creation; (2) collaboration; (3) networking; and (4) digital media competencies and literacies. As an example, we present the applications of GSP in digital storytelling. Finally, we discuss the importance of how learners are prepared for the future global world.

Keywords: Technology, Global, Learning, Pedagogy, School, ICT

Introduction

Finland was one of the leading global information societies in the 1990s, but this leading edge status ended with the arrival of the new millennium. Since 2006 (Brese & Carstensa, 2009), evidence has been growing to show that applications of information and communication technology (ICT) have decreased to moderate levels in Finnish schools, while student use of new communication technology outside of schools has increased. Students use computers and social media in their everyday lives, but schools do not necessarily provide technological learning environments as effectively as they could (Ubiquitous Information Society Advisory Board, 2010). There are also many indications that teachers do not have the skills to apply technology in new learning environments, which today typically include a strong social media component (Niemi, 2011). In Finnish society and schools, the use of technology is now under a reform process. As one aspect of these reform activities, a national program, “Learning Solutions” (2011-2015), was established to seek new concepts and practices for using technology as a tool in learning settings that are radically changing (Tekes, 2013). Through its calls for action, the program had accepted almost 20 projects by 2013, all of which had the same aim: To assess how different partners, such as students, teachers, researchers, and public and private sectors can more effectively develop the pedagogical use of ICT in Finnish schools, and equip students with skills for the 21st century. One of these projects is “Finnable 2020”, which aims to develop the idea of a boundless classroom in a global world. The main purpose of the project is to find new principles and practices to show how schools can cross borders of formal and informal learning settings, and to encourage different learners to work together, locally and globally.

In this article, we aim to describe the type of theoretical basis that is required for new practices when crossing boundaries of traditional classrooms. The Finnable 2020 project has created the global sharing pedagogy (GSP) model for its theoretical framework. First, we analyze the change in the global world; it has been claimed that this change means that a new pedagogical concept is required. We will then introduce the main

elements of GSP. Finally, we provide some examples of the way in which the GSP model has been locally and globally implemented in 21st century educational settings, using technological solutions.

Megatrends of Changing Learning and Learning Environments

Boundless Life-Wide Learning

The concept of learning has gone through a multi-layered process of redefinition in recent years. It is regarded as an active individual process, whereby learners construct their own knowledge base. Learning is also increasingly viewed as a process that is based on sharing and participation with different partners in a community, and as a holistic constructing process that is interconnected with learners' emotional, social, and cultural premises (Cole, 1991; Salomon, 1993; Cole & Cigagas, 2010; Niemi, 2009; Säljö, 2012; Hakkarainen et al., 2013). The concept of "life-long learning" is more of a life-course process. We learn in different situations and areas of life that are cross-boundary. Learning and knowledge are no longer the monopolistic domains of schools, or even universities. In our modern societies, there are many forums of learning, which may be called *learning spaces*, and working life and work organizations are important learning spaces (Nonaka & Konno, 1998; Nonaka & Takeuchi, 1995; Nonaka & Toyama, 2003). Technology-enriched learning tools and spaces with mobile technology, Web 2.0 applications, social media, and all existing digital resources create a powerful arena for learning, both in formal and informal education settings (Multisilta, 2012). Our learning is life-wide, and consists of vertical life-course learning, as well as the horizontal dimensions of learning. This means that there are continuous processes of learning: vertically, throughout various ages, and horizontally, in cross-boundary spaces of life (Niemi, 2003). Learning is not limited to certain ages or institutions.

21st Century Skills as the Aim of Educational Systems

The way to prepare a new generation for the future, its working life, and life-wide learning has become as an urgent topic on the agenda of educational systems (e.g., Binkley et al., 2012). The European Union (2006) has defined the most important core competencies, and the Organisation for Economic Co-operation and Development (Griffin 2013; Griffin, McGaw, & Care, 2013), as well as many global organizations, have identified necessary 21st century skills. The most important message is that schools must seek new forms of teaching and learning. Many discussions and documents have proposed ways to face the future, and have delineated the roles of schools and teachers in these changing contexts (e.g., Bellanca & Brandt, 2010; Griffin, McGaw, & Care, 2012). Anders Schleicher (2012) argued that “Everyone realises that the skills that are easiest to teach and easiest to test are now also the skills that are easiest to automate, digitise and outsource. Of ever-growing importance, but so much harder to develop, are ways of thinking - creativity, critical thinking, problem-solving, decision-making and learning; ways of working – including communication and collaboration; and tools for working – including information and communications technologies”.

Although definitions of 21st century skills vary, there are some commonalities. The most important factor is that students should have the capacity to learn throughout their lives, and that education should provide the skills and mental tools to enable them to do so. Inquiry and knowledge-creation abilities are the most crucial, but they should be connected with analytical and critical thinking skills, as well as creativity. Students should have the capability to ask questions, and not simply seek or repeat ready answers. They need the ability to work independently, but also, increasingly, collaboratively. Life is ever more bound up with technology; learning environments are continuously changing, and ICT provides many new learning opportunities.

Working Life is changing toward Interconnectedness

Friedman (2005) has described our global world as flat. He applied the concept to the 21st century to describe the ways in which globalization has changed core economic concepts. In his opinion, this flattening is a product of a convergence of the personal computer with fiber-optic micro cables, and the rise of work-flow software. He termed this period “Globalization 3.0”, differentiating it from the previous “Globalization 1.0” (in which countries and governments were the main protagonists), and “Globalization 2.0” (in which multinational companies led the way in driving global integration).

Friedman recounted many examples of companies based in India and China, which, by providing a range of labor from typists and call center operators, to accountants and computer programmers, have become integral parts of the complex global supply chains for companies. The flat world is increasing social practice in all domains of life, not only in the global economy. New technology and social media expand our communication without any real limitations. Ramirez, Hine, Ji, Ulbrich, and Riordan (2009) proposed that students need experiences and competencies to determine how to work in the flat world. We also have evidence to suggest that Web 2.0 technologies facilitate the acquisition of the skills required to succeed in a new working life (e.g., Siemens, 2005).

The research group at the Institute for the Future (Davies, Fidler & Gorbis, 2011) analyzed how work places will change in the coming years. The qualities are based on a scenario that our global world will be increasingly connected. This increased global interconnectivity puts diversity and adaptability at the center of organizational operations. Workplace robotics nudges human workers out of rote, repetitive tasks, and new media ecology requires new literacies. The group has identified the most important skills that workers will need in the future, in which working life will be connected with technology, but requires far more than technological skills. In addition to identifying those abilities needed to use new devices and technological applications, the research group (Davies, Fidler & Gorbis, 2011) summarized the following skills as being the most important: sense-making, social intelligence, novel and adaptive thinking,

cross-cultural competency, computational thinking, new-media literacy, transdisciplinarity, design mindset ability, cognitive-load management, and virtual collaboration. Skills and abilities will be related to higher-level thinking, and social relationships that cannot be easily transferred to machines, and which will enable us to create unique insights, will be critical to decision-making. Workers will require social skills that enable them to collaborate and build relationships of trust locally, as well as globally, with larger groups of people in a variety of settings. Workers must also be capable of responding to unique, unexpected circumstances that may occur at any moment (Autor, 2010), and they will also require an ability to understand concepts across multiple disciplines. New media literacy is a necessary aspect of work, including critical reading and production skills with regard to the many forms of media. This requirement will be increased (Davies, Fidler & Gorbis, 2011), and in complex work environments cognitive load management is becoming urgent. Workers must have an ability to discriminate and filter information for importance, and to understand how to maximize cognitive functioning using a variety of tools and techniques. Working environments view workers as agents that take a design approach to work. It is usual for us to already create, modify, and customize products and our environments to fit to our needs. Workers are also members of virtual teams. Emerging technologies make it easy to collaborate, despite physical distance. According to Davies, Fidler and Gorbis (2011), the “virtual work environment demands a new set of competencies”. Among these competencies are “the ability to develop strategies for engaging and motivating a dispersed group”. For example, video games and gamification could be used in motivating future virtual teams (Davies, Fidler & Gorbis, 2011). We may conclude that teachers and schools are at the forefront of new ways to help students to achieve those skills and abilities that will be necessary in their future.

Knowledge Ecosystem

Today, knowledge creation is viewed as a non-linear, dialectical process, with different partners and stakeholders. It is also an interaction with technology-based learning environments and devices, which can be called cultural artifacts. It is an interactive process, in which application of knowledge is no longer a one-directional process. Rather, it is a joint process, whereby all partners, learners, experts, teachers, and other practitioners, as well as representatives of companies and researchers, work together in a complementary manner, seeking evidence for the creation of new tools and improved learning practices.

Learning has increasingly been viewed as being embedded within a social context and framework (Reynolds, Sinatra, & Jetton, 1996, p. 98; Cole, 1991). Social perspective theories have variously been called social constructivism, sociocultural perspective, socio-historical theory, and socio-cultural-historical psychology. Although the views of social perspective theorists are diverse, each theorist posits that learning occurs through the mediation of social interaction. Rather than use the terms *acquisition* and *representation*, social perspective theorists regard knowledge as constructed by, and distributed among, individuals and groups, as they interact with one another and with cultural artifacts, such as pictures, texts, discourse, and gestures. Knowledge is not an individual possession, but is socially shared, and emerges from participation in social activity.

When defining knowledge creation as an interactive process, we see that all educational settings, including schools, should prepare students for “virtuous knowledge sharing” (European University Association, 2007, p. 21). This notion is built on the conviction that creative knowledge production is a sharing process. Instead of merely solving problems, individuals and organizations create and define problems, develop and apply knowledge to solve the problems, and then further develop new knowledge through the action of problem-solving. The organization and individuals grow through such a process (Williams, Karousou, & Mackness. 2011; Nonaka & Takeuchi, 1995; Nonaka & Konno, 1998; Nonaka & Toyama, 2003). According to Nonaka & Toyama (2003), and knowledge-creation

is a transcending process, through which entities (individuals, groups, organizations, etc.) transcend the boundary of the old into a new self by acquiring new knowledge. In the process, novel conceptual artifacts and structures for interaction are created, which provide possibilities, as well as constrain the entities, in consequent knowledge creation cycles.

We can discuss a “knowledge ecosystem” in which all partners, learning resources, and stakeholders provide additional value to each other by sharing and collaboration (Multisilta, 2012). In learning ecosystems, people work together and expand their learning through social collaboration and interaction with cultural artifacts. It means moving from static, transmitted content to knowledge that is ever-renewable and often constructed jointly with other learners. Learning is a dynamic concept that depends on learners’ epistemological propositions and social-cultural contexts (Cole & Cigagas, 2010; Niemi, 2009; Säljö, 2010, 2012).

The reciprocal relationship between a human being and cultural artifacts forms the grounds for development, which is not a straight path of quantitative gains and accumulations. Social perspective theories emphasize the role of social and cultural contexts in cognition. They highlight the effects of the social framework on our beliefs, concepts, and construction of knowledge. Learning is embedded within a social context and framework, and is a mutual interaction between human beings and cultural artifacts.

Salomon (1993) presented the concept of *distributed cognition* to describe how the individual differences between human beings, and their own knowledge constructions created by their minds, are acknowledged. Each individual has potential, but how this potential is developed and activated depends on cultural symbol systems, and how such a joint system interacts in learning. Salomon views this joint system as one in which learners interact with one another in a spiral-like manner. “An individual’s inputs, through their collaborative activities, affect the nature of the joint, distributed system, which in turn affects their cognitions such that their subsequent participation is altered, resulting in subsequent altered joint performances and products” (Salomon, 1993, p. 122). In virtual learning contexts, distributed cognitions offer enormous opportunities to the minds of students, and to culturally-constructed virtual artifacts (e.g.,

knowledge, sounds, visual images, human communication) in reciprocal and interactive relationships.

New Learning Spaces Require Engagement and Self-Organized Learning

The capacity to learn is not only a cognitive phenomenon. It is also an emotional and social process (Boekaerts, 1997; Pintrich, 2000; Pintrich & Ruohotie, 2000). We view learning as a holistic, constructive process that is interconnected with learners' emotional, social, cultural, and ethical reality. In technological environments, learners face all of these components, and very often must take an active role without the direct supervision or guidance that is available in face-to-face learning environments. Technological environments provide open access to knowledge and learning, but they also require a student to have the capacity to manage their own learning; learners must have an awareness of how to manage their learning processes. In learning psychology, we have a long tradition that provides clear evidence that individuals need skills to steer their own learning processes. In the light of self-regulation research, self-regulated learners have a large arsenal of cognitive and metacognitive strategies that they readily deploy, when necessary, to accomplish academic tasks. In addition, self-regulated learners have adaptive learning goals, and are persistent in their efforts to reach these goals (Schunk & Zimmerman, 1994). Finally, self-regulated learners are proficient at monitoring and, if necessary, modifying the strategy they use in response to shifting task demands. Self-regulated learners are metacognitively active participants in their own learning (Pintrich & Ruohotie, 2000).

Students control their learning through metacognition, and also use cognitive and resource management strategies. Pintrich (2000) and Pintrich and McKeachie (2000) introduced important control strategies in learning tasks. They grouped strategies into three broad categories: cognitive, metacognitive, and resource management. The cognitive category

includes strategies related to a student's learning or encoding of material, as well as strategies to facilitate retrieval of information. The metacognitive strategies involve those related to planning, regulating, monitoring, and modifying cognitive processes, while the resource management strategies concern a student's method of controlling resources (i.e., time, effort, outside support) that influence the quality and quantity of their involvement in the task. Davies, Fidler and Gorbis (2011) described this as the ability to manage the cognitive load.

In technological environments, self-regulated learning means that students use their cognition, as well as resource management skills. Respectively, new technology provides tools to support and strengthen a learner's capacity to monitor their own learning, and also seek resources through collaboration.

Jones, Valdez, Nowakowski, and Rasmussen (1994) suggested that successful, engaged learners are responsible for their own learning. These students are self-regulated, and are capable of defining their own learning goals, and evaluating their own achievements. They are also energized by their learning; their joy in learning leads to a lifelong passion for solving problems, understanding, and taking the next step in their thinking. These learners are strategic, in that they know how to learn and are capable of transferring knowledge to solve problems creatively. Engaged learning also involves being collaborative, that is, valuing and having the skills to work with others.

Taylor and Parsons (2011) analyzed what student engagement might be. They introduced several types of engagement: academic, cognitive, intellectual, institutional, emotional, behavioral, social, and psychological. After exploring numerous definitions, they concluded that the following criteria characterize engagement:

1. Learning that is relevant, real, and intentionally interdisciplinary, at times moving learning from the classroom into the community.
2. Technology-rich learning environments, not just computers, but all types of technology, including scientific equipment, multimedia resources, industrial technology, and diverse forms of portable communication technology.

3. Learning environments that are positive, challenging, and open, sometimes called “transparent” learning climates, encourage risk-taking and guide learners toward co-articulated high expectations. Students are involved in assessment for, and of, learning.
4. Collaboration via respectful “peer-to-peer” type relationships between students and teachers.

Toward Global Sharing Pedagogy

The Finnable 2020 project has drafted a model of the GSP for promoting 21st century skills in schools. The aim has been to connect megatrends of changes in learning concepts, knowledge creation, and working life with teaching and learning. The GSP is based on socio-cultural theories. Learning is viewed as a result of dialogical interactions between people, substances, and artifacts (Pea, 2004; Cole & Cigagas, 2010; Säljö, 2012; Hakkarainen, Paavola, Kangas, & Seitamaa-Hakkarainen, 2013). The primary objective is to strengthen student engagement in learning and mediate students as they become active learners and knowledge creators in changes they are facing already, and will increasingly face in their future. However, engagement is not viewed only as an end. It is also a means for further learning. It is regarded as a motivational component that consists of the emotional states of students, such as the joy and fun experienced in learning, as well as qualities that are typical of self-regulated learning. It includes commitment to learning tasks, and a willingness to make efforts to achieve an objective (Pintrich, 2000; Pintrich & McKeachie, 2000).

Vygotsky (1978) introduced the idea of tools, symbolic and social mediators, to the analysis of the learning process, and defined the role of mediators as being to select, change, amplify, and interpret objects to the learner (1978, 67). The framework of GSP has sorted mediators into four categories (Figure 1): 1) *Learner-driven knowledge and skills creation*; 2) *collaboration*; 3) *networking*; and 4) *digital media competencies and literacies*.

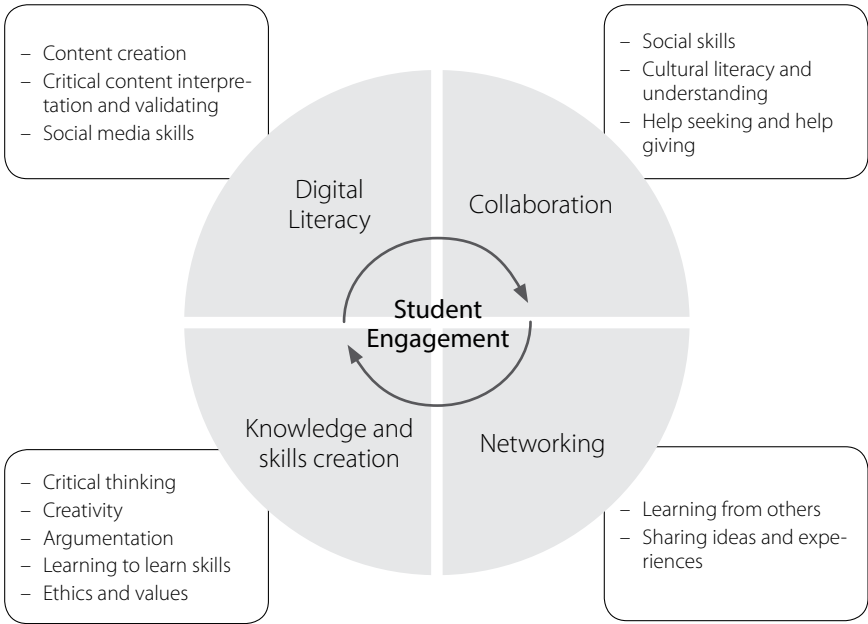


Figure 1. Mediators in global sharing pedagogy

The role of mediators is very interactive. They are interconnected, and can act as both means and ends. For example, according to Multisilta and Perttula (2013), when students learn using digital technologies, these technologies enrich learning experiences, and contribute to the continuum of learning. The use of the technology is an experience in itself, but it also provides new skills that can be used in following learning situations.

Learner-driven knowledge and skills creation is a mediator that provides learners with symbolic tools for the development of active learning methods and metacognitive skills. This is a dynamic process in which learners, guided by reflection and metacognition, manage their thinking and learning resources. Learners require strategic skills to manage their own learning and create new knowledge, both individually and collaboratively (Pintrich & McKeachie 2000; Nevgi, Virtanen, & Niemi, 2006). Schools and teachers should encourage students to engage in this type of independent learning (Niemi, 2002; Scardamalia, 2002; Scardamalia &

Bereiter, 2003). Learning affects students cognitively, emotionally, socially, and morally, and the more independent and self-regulating students are, the more they must also be aware of, and employ, ethics and values. Mediation toward student-driven knowledge creation consists of different kinds of symbolic tools, such as critical thinking, creativity, argumentation, “learning to learn” skills, and ethics and values.

Collaboration is a social mediator that allows or requires students to work together (Hull et al., 2009; Pea & Lindgren, 2008; Rogoff, 1990; Wells 1999). It ensures that they can learn and work in the global world in the future; they must develop the following competencies beyond the purely “cognitive”: social skills, cultural literacy and understanding, help-seeking, and help-giving strategies.

Networking is a social mediator that uses synergy of expertise of other people and also provides tools for intercultural learning (Starke-Meyerring, Duin, & Palvetzian, 2007; Starke-Meyerring & Wilson, 2008). Learning is a continuous process of dialogical interaction with other people and cultural artifacts. In distributed cognitions and interaction with different artifacts, people introduce remarkable value that enhances their learning and competencies. These processes are mutually constitutive. All learners are also contributors. Thus, networking means learning from others, as well as sharing ideas and experiences.

Digital media competencies and literacies is primarily a tool mediator that enriches learning through new technology environments, but it can also consist of social and symbolic mediators through different kinds of digital environments (Säljö, 2012). In technological environments, learners are both content producers and consumers. As such, they need the skills to study and work in digital environments. They must also critically assess and validate the knowledge they find and create; they must be accountable to the norms of discourse and argumentation established by the adult communities of practice in each discipline. They also require skills in the creation and discussion of social media, and in promoting ethical behavior in these media environments. Mediation of digital media competencies and literacy consists of the following skills that schools should provide to students: content creation, with critical content interpretations and validation, and social media skills that are part of digital environments.

How to apply GSP in teaching and learning

The GSP model has been applied in the “Digital Storytelling” project, which was a subproject of Finnable 2020. Students ($n=319$) in three countries created digital stories with video cameras and the MoViE (Mobile Video Experience) platform (<http://www.finnable.fi/digital-storytelling.html>) for creating and sharing collaboratively produced video stories in Finland, Greece, and California. MoViE enables users to record video clips using their mobile devices (phones, tablets, digital cameras, etc.), upload videos to the MoViE web site, and create video stories using all the clips gathered by themselves and their collaborators (Multisilta & Mäenpää, 2008; Multisilta, Perttula, Suominen, & Koivisto, 2010; Multisilta, Suominen, Östman, 2012; Tuomi & Multisilta, 2010, 2012). Existing video clips can also be remixed to create new video stories, and the content of the videos is not limited by the MoViE. Teachers and students can create videos that fit their needs and support learning, both in and outside the classroom. The purpose was that students would have international partners with whom they could share their videos, and could receive comments and feedback from their local and/or international peers. An assumption was that video products are artifacts that challenge users to learn more and step outside of their earlier proximal zone of learning, and that media-sharing environments would add to learners’ engagement (Pea & Lindgren, 2008; Lewis, Pea, & Rosen, 2010; Multisilta, Suominen, & Östman, 2012; Multisilta & Pea, 2012). The results (Niemi & Multisilta, 2014) provided good support for the idea that digital storytelling has a great effect on students’ motivation and enthusiasm. These components included both fun and commitment to hard work. The greatest predictor of the mediators of engagement was the MoViE platform, which provided an opportunity to create, shoot, and remix one’s own story in collaboration with a peer group. The second greatest predictor was collaborative group work; students learned in collaborative processes when producing their videos.

GSP with its mediators also highly effectively predicted students’ learning outcomes, which were primarily 21st century generic skills, such as

problem-solving, argumentation, decision-making, and cooperation. All components of GSP (Niemi & Multisilta, 2014): (1) *Learner-driven knowledge and skills creation*; (2) *collaboration*; (3) *networking*; and (4) *digital media competencies and literacies* had a high predictive effect on student learning outcomes, providing support for the model. In particular, active learning methods, such as learner-driven knowledge creation and MoViE as a digital media tool, were very important (Niemi & Multisilta, 2014).

Learning is acknowledged in Europe, as well as globally, as the very core of economic development (Conçeição, Heitor, & Lundwall, 2003; Binkley et al., 2012). There is a great trust in the power of knowledge and learning. However, there is also a growing concern: Who is becoming empowered and who is not? The real danger emerges when young people drop out of learning pathways. In our global world, there is a growing polarization between people who have rich learning environments and the abilities to learn new competencies, and people who are not in this position and do not have these skills. We must create new solutions for the use of technology to empower different learners, and help them become active learners and citizens. It also means making efforts to help individuals find meaningfulness in their life.

Meaningfulness is very often linked to active learning and engagement in learning. Taylor and Parsons (2011) analyzed several definitions of engagement, and despite differences, the common feature is that engagement is linked to a student's active role: students design, plan, and carry out their projects. Meaningfulness can also be promoted when students publicly exhibit a project to themselves, to the community, or to a client. It has a transformative effect on their perception of themselves, their relationship with learning, and their sense of place in the world around them. The main function of schools is to prepare students for enquiry, which will help them take an active role in their lives.

All over the world, 21st century skills have become an urgent topic on the agenda of educational systems (Binkley et al., 2012). Schools are required to seek new forms of teaching and learning for the future. Many discussions and documents propose ways to face the future and delineate the roles of schools and teachers in these changing contexts. Technology is

not an aim in and of itself, but it can be an important tool for empowering students for what lies ahead.

Why should we prepare our students for global collaboration and networking? Why is the pedagogical model “global”? ICT crosses borders. Social media has broken all borders, nationally and internationally. The Internet provides learning resources and databases that are accessible across and within nations. In many areas of life, people depend on international knowledge production, and working environments are increasingly global. Our students will be both cosmopolitan learners and workers. This means that one of the important aims of schools should be to prepare them for a collaborative culture and the idea of sharing. Learner concepts regarding their agency in the global world mean that they should become active global citizens, providing their contribution in the joint world. This agency can be achieved only by having authentic experiences in schools across borders and cultures. The GSP proposes that schools possess a teaching and learning culture that allows and encourages the entire school community to be open to collaboration, networking, active knowledge creation, and digital literacy. This also means active interactions with partners outside the school, and connections with other schools, both locally and globally.

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2 Crossing School-Family Boundaries Through the Use of Technology

Tiina Korhonen and Jari Lavonen

Abstract

The aim of this study was to discover how already-available information and communication technology (ICT) in homes and schools could be better utilized to enhance home-school collaboration (HSC). Novel ideas and innovations for use of existing ICT to support HSC, including innovations on learning and assessment, were generated by students, parents, and teachers. Key data was collected from two second and third grade classes of an elementary school in Espoo, Finland during the 2009–2010 school year. The study was conducted using design-based research (DBR), with both practitioners and researchers aiming to produce meaningful changes in everyday HSC activities. During the first phase of the study, the needs, limitations, and ideas regarding HSC and the use of ICT in support of HSC were collected from all participants. A preliminary analysis of the data was discussed among teams of volunteer teachers, parents, and students. The teams selected candidate ideas for practical testing and further development in two DBR cycles. After the cycles, a guide based on the innovations was created to help other teachers, students, and parents utilize ICT in HSC. The study results indicate a multitude of ways to use ICT in HSC, including communication and interaction between students, teachers, and parents, and support of student learning and growth. A novel

result of this study is that ICT can facilitate the practical implementation of new types of collaboration, such as parent participation in learning at school and student learning in their free time.

Keywords: Home-School Collaboration, ICT, Deployment and Development of Innovations

Introduction

The use of ICT in education, including the use of Internet applications and learning environments, has undergone rapid development during the last 20 years. Today, students, teachers, and parents have a wide selection of ICT tools and environments at their daily disposal. In the school, teachers and students can use ICT for learning and for information retrieval, for individualized learning, and for interaction between the school and its surrounding community, such as HSC (Haaparanta & Tissari, 2008).

Despite the wide availability of ICT facilities, their use has not yet become a natural part of everyday school life. Their use does not support teaching and learning and is limited in various collaboration situations (OECD, 2004, 2006; Lavonen, Juuti, Aksela, & Meisalo, 2006; Younie, 2006; Hayes, 2007; Hennessy et al., 2007; European Commission, 2013). In order to make the use of ICT a natural part of interactions between a school and its surrounding community, ICT must be integrated into the school's structural and pedagogical development activities (Haaparanta & Tissari, 2008).

In early 2011, the Finnish National Board of Education made changes to the national-level framework curriculum, including the section concerning HSC. The new policy emphasizes the importance of HSC in supporting the personalized, holistic growth of students and learning outcomes. For the first time, the renewed curriculum includes a policy advocating the use of ICT to enhance HSC (Finnish National Board of Education, 2011).

This study uses a DBR approach to explore the implementation and use of ICT to support HSC. The key conjecture is that it is possible to imple-

ment ICT-based collaboration and obtain results with the ICT facilities already available today at home and in the school. The assumption is that this can be achieved by identifying and developing innovations on ICT use in HSC, by involving end users in the generation and development of ICT use ideas, and by identifying and addressing the general challenges of ICT use and implementation.

Research Questions

The study aimed to uncover what practical possibilities are there in the use of ICT in HSC. In addition, the study aimed to find out how students, teachers, and parents experience ICT-supported HSC and the adoption of ICT for HSC. In this paper, we focus on the research question concerning the possibilities that parents, teachers, and students see for the use of ICT in HSC.

Home-School Collaboration

The key objective of HSC is to support the holistic, safe growth and development of children and youth (Finnish National Board of Education, 2011). A closer relationship between parents and their children's education and school activities has an increasingly supportive effect on child development and academic performance (Fullan, 2007).

In this study, we describe HSC based on the six types of home and school involvement defined by Epstein (2009): parenting, communicating, volunteering, learning at home, decision making, and collaborating with the community.

Key themes in HSC are partnership and shared responsibility. Important success factors in a home-school partnership include caring, trust, and respect. A home-school partnership provides students with a feeling of being cared for and being supported by the community, thus encouraging students, guiding them, and motivating them to do their best (Epstein, 2009).

The key challenge in HSC is taking into account the varying needs and goals of teachers, students, and parents. The general aim is to find ways to arrange HSC to support the development of an individual student and to improve the team spirit and the feeling of social relatedness within the class (Siniharju, 2003).

The lack of available time is a challenge in HSC for both teachers and parents. Faced with increasing class sizes, teachers must find time for HSC with all parents within normal working hours, while also encouraging more passive parents to collaborate. Many parents would like to be better informed about their children's progress and school events. At the same time, parents also struggle to find time for HSC (Siniharju, 2003).

For successful HSC, respect for the thoughts, opinions, and wishes of all stakeholders (teachers, students, and parents) is essential. The goal is that through a long-term collaborative development activity, more families and teachers will learn to work with one another as parts of a community for the benefit of the children. As collaborative development work is time-consuming, to achieve good results it should be planned as a regular activity with all stakeholders (Epstein, 2009).

ICT Use in Home-School Collaboration as an Innovation

In this study, the various possibilities of using ICT to enable HSC and to overcome the challenges in the use of ICT in HSC are referred to as *innovations*. An innovation is an idea, practice, or object that is perceived as new (Rogers, 2003).

In order to enter, or *diffuse*, into actual use, these innovations should be *adopted* by individual teachers, parents, and students. We analyze the process of adoption within the framework of Rogers' theory on the adoption of innovations (Rogers, 2003).

According to Rogers, when an individual determines whether or not to personally accept or reject an innovation, they seek information about

the innovation and actively process that information, typically with other people in the community. Rogers divides this adoption process into five phases: knowledge, persuasion, decision, implementation, and confirmation (Rogers, 2003).

This study focuses on the last three phases of Rogers' adoption process. Specifically, the study considers four key aspects of the adoption process with the potential to affect the outcome of adoption in a positive or negative way.

Individualization

In the *re-invention* of an innovation, an adopter or group of adopters modifies an available innovation to better suit their needs. Through re-invention, the innovation is more likely to be accepted (Rogers, 2003). We refer to such new or modified innovations created through re-invention, or individualization, as *individual innovations*.

This study applies the DBR principle of *generating ideas* (McKenney & Reeves, 2012) to encourage participants to re-invent innovations and thus create novel individual innovations, which will more likely be adopted into practice. In this study, individual innovations include the ideas of teachers, students, and parents about the use of the ICT facilities in HSC. The innovations may include the use of ICT tools available in the classroom or at home, such as computers, digital cameras, interactive whiteboards, document cameras, as well as a web-based learning environment (WBLE) called *Opit*, with access available to students, teachers, and parents.

Participation

Our assumption is that participation by teachers, students, and parents in the generation and implementation of ideas will support their commitment and adoption of the innovations. This assumption is supported by existing research, which indicates that user involvement in innovation implementation increases the likelihood of continued use and further development of the innovation (Rogers, 2003).

Usability

The usability of an innovation indicates the extent to which users can employ the innovation to achieve a particular goal; specifically in this study, how users can employ ICT innovations in HSC.

Nielsen (1993) approached the concept of usability from the perspective of adoption and acceptability of the innovation. Along these lines, usability could be defined through five quality components. *Learnability* of the innovation defines how easy it is for users to start using the innovation. *Efficiency* shows how quickly users can (after initial learning) perform HSC activities using the innovation. *Memorability* defines how easily users can re-establish proficiency after not using the innovation for a while. *Freedom of error* defines how error-prone HSC activities using the innovation are. Finally, *satisfaction* defines the degree of pleasantness to which users experience the use of the innovation and how easily they can modify the innovation for their own individual innovations.

We assume that involvement of various stakeholders in the development of innovations for ICT use in HSC can enhance the usability of the innovations. With better usability, the innovation becomes easier to learn and use, which should lead to higher adoption rates. Fullan (2007) categorizes the factors that can affect adoption of an innovation into two groups. The first group, properties of the innovation, can be seen to encompass the usability of the innovation as well as properties of the artefact, including computers, devices, applications, and the WBLE.

Environment

Fullan (2007) describes the second group of factors as environmental factors, which include factors that are local to the school and community and more external factors, such as national-level curriculum. Local factors might include the pedagogical orientation of the teachers, the collaboration and reflection practices between teachers and their beliefs about the usability of ICT tools, and the culture of collaboration and leadership within the school (Fullan, 2007).

Local factors also include the characteristics of the community adopting the innovation, for example, ICT skill levels of the parents, availability of ICT equipment within homes and the school, and the effort required to learn how to use the innovation (Fullan, 2007).

The adoption of ICT-based innovation at the school and in the community may also be affected by a sense of time limitations, especially a need for additional time to learn how to use the ICT tools. Adoption of an innovation is also affected by the availability of other resources, such as technical and pedagogical support, adequate financial resources, and support for professional development. In addition, existing beliefs of teachers, parents, and students regarding the role of ICT use in HSC may influence the adoption of innovations (Fullan, 2007).

Design-Based Research (DBR) Process

As a methodological framework for designing an innovation and its use, this study used the DBR approach, which has been suggested as a solution for discontinuity between educational research and practice (Juuti & Lavonen, 2006). DBR is a general framework for the design, development, implementation, and evaluation of educational activities within a pragmatic framework. DBR emphasizes three aspects: 1) a design process is essentially *iterative*, beginning with the recognition of the need to change practice; 2) the design process generates a widely usable *artefact*, such as learning activities or a learning environment; and 3) the design process provides *educational knowledge* for more intelligible practice (Design-Based Research Collective, 2003; Bell, Hoadley, & Linn, 2004).

DBR is comprised of a combination of theory development, prescriptions for successful design processes, and prescriptions for successful design solutions. The design process includes four phases: 1) *analysis* of practical problems, 2) *development* of solutions, 3) *iterative cycles* of testing and refinement of solutions in practice, and 4) *reflection* to produce new research through the identification of new or enhanced design principles (Reeves, 2006).

In this study, the DBR process was executed in alignment with the rhythm of the school year and in collaboration with teachers, students, and parents (see Figure 1). The study was conducted on two second and third grade classes during the 2009–2010 school year in an elementary school in Espoo, Finland. Both classes were inclusion classes, in which special-needs children and general education children studied together. The study was carried out through two design cycles. During the cycles, the students, teachers, and parents generated ideas about the use of ICT in HSC. These ideas were evaluated, further developed, tested, and applied in real HSC situations. Both the theory and practice of HSC were advanced through these two design cycles (Gravemeijer & Cobb, 2006).

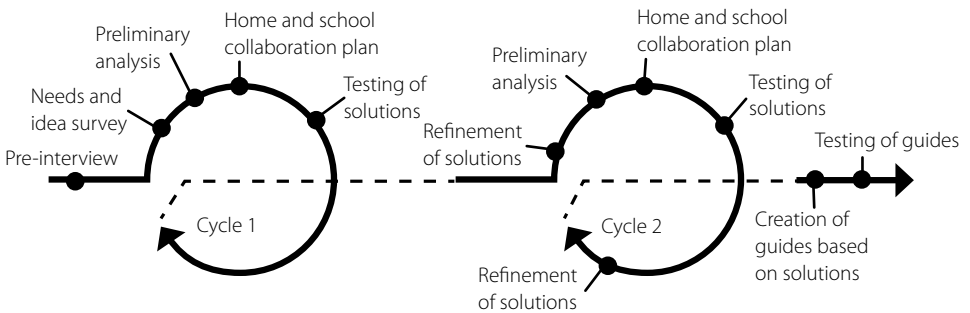


Figure 1. The application of design cycles in this study.

Data Collection and Analysis

The data collected in this study consists of responses to questionnaires, transcriptions of interviews, video recordings, field reports, and notes of project meetings. Table 1 outlines the data collection methods used during each study phase.

The study participants included 45 students, 21 teachers, and 94 parents. Of these, 4 teachers, 39 students, and 72 parents participated in the first two design cycles. The remainder of the participants took part in the testing of the artefact.

Table 1. Data Collection Methods in Each Study Phase

Study phase	Target Group		
	Teachers	Parents	Students
First design cycle			
Needs and idea survey	Questionnaire	Questionnaire	Group work led by own teacher, brainstorming in groups (video recording)
Home-school collaboration plan	Field report PPT-presentation	Field report PPT-presentation	-
Testing	-	-	-
Second design cycle			
Solution refinement and new innovations	Question-based reports as pair work	Questionnaire	Group interviews in groups of 4 (video recording and notes)
Home-school collaboration plan	Video recording and PPT-presentation	Video recording and PPT-presentation	-
Testing	Reports on the intensive ICT use weeks as pair work	Questionnaire on intensive ICT use weeks (together with child)	Questionnaire on intensive ICT use weeks (together with parent)
Final phase			
Solution refinement and processing of the artefact	Interview in work pairs	Questionnaire (all) and an in-depth interview with selected parents (6)	Questionnaire and group discussion (video recording)
Testing of the artefact	Interview	Interview and questionnaire	Interview

As the collected data manifests itself in a variety of formats, a relational database tool (Microsoft Access) was used to organize and analyze the data. Each type of collected data (interview replies, questionnaire answers, video recordings, and reports) was entered into its own table to easily search, code, and filter the data (Figure 2). As part of this process, each type of data was transformed into a technical format suitable for the database (for example, transcripts of the audio recordings of the interviews were prepared). Background information about study participants was also collected, recorded in the database, and made anonymous. The use of a relational database enabled the linking of related information, thus allowing for exploration of relationships between the units of data.

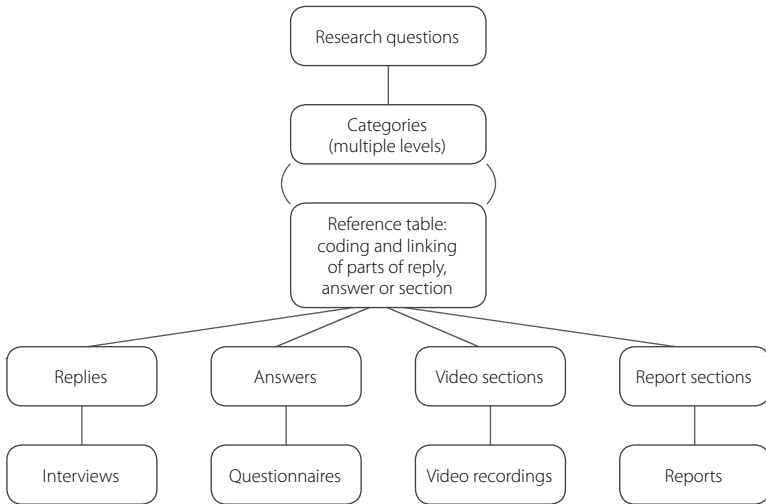


Figure 2. Organization, coding, and analysis of the collected data.

The collected data were analyzed using qualitative, inductive content analysis. The goal of content analysis is to construct categories that model the concepts related to the use of ICT in HSC in light of the research questions (Elo & Kyngäs, 2008).

First, the collected data in the database was read through several times. Next, the units of analysis were identified. A unit of analysis is a mention, a sentence, or part of a sentence. Each unit of analysis was then coded into a first-level category that was identified using inductive content analysis. Through further inductive content analysis, the first-level categories were combined to form higher-level categories. All units of analysis and the mapping of units and categories were maintained in reference tables to allow for verification of the analysis.

The following steps were taken to increase the reliability. To acquire deep knowledge of the raw data, the first author read the data several times. The first author then presented the coding scheme, preliminary categories and examples of the raw data in each category to the other author, after which minor modifications were made to the category definitions. After completing the categorization, the first author presented it with examples of the raw data to the second author. Agreement on the definitions of the categories and on the coding of the data according to the categories was high.

Results

In this paper, we will focus on the possibilities that parents, teachers, and students identified in the use of ICT in HSC.

In the study, teachers, students and parents indicated a variety of possibilities or individual innovations for the use of ICT in HSC. Two main categories of possibilities were identified in the analysis of the collected data: *communication and interaction* and *support for learning and growth*. In the analysis, the main categories were formed by combining two levels of lower-level categories, of which the first level is presented here (Table 2).

Table 2. Categorization of ICT Use Possibilities in HSC

Main Category	Lower-Level Category Related to the Main Category	
<i>Communication and Interaction</i>		
Information	<ul style="list-style-type: none"> • News • Materials • Direct messaging 	<ul style="list-style-type: none"> • Scheduling, • Student-specific information
Participation	<ul style="list-style-type: none"> • Pictures and videos of school work • Scheduled remote participation 	<ul style="list-style-type: none"> • Unscheduled remote participation • Sharing of views and opinions • Parent-led activities
Support for Learning and Growth		
Support for learning and personalization at school	<ul style="list-style-type: none"> • Personalized learning • Mobile schoolwork • Student portfolio 	<ul style="list-style-type: none"> • Student email, • Social learning
Supporting for learning at home	<ul style="list-style-type: none"> • Homework • Exam preparation 	<ul style="list-style-type: none"> • Parent support
Evaluation	<ul style="list-style-type: none"> • Continuous evaluation • Self-evaluation • Evaluation meetings 	<ul style="list-style-type: none"> • Exams and quizzes • Teacher feedback • Parent feedback

Information

News. In the lower grades of Finnish primary schools, the traditional method of communicating between school and home is based on the use of a home message notebook (paper) that is carried by every student in their school bag from school to home and from home to school. Through the messages written in the notebook, the teacher and parents can communicate on topics pertaining to the student. Moreover, the notebook carries class-specific or school-wide news as attachments.

Several innovations related to the use of ICT in HSC arose from the implementation of an enhanced version of the home message notebook that was implemented through the WBLE and its various tools (i.e., e-mail, blogs, and discussion forums).

Parents took this one step further and presented several visions of extending the ICT-based home message notebook to cover class-specific and school-wide news. For example, the front page of the school's WBLE could provide school-wide news and easy links to class-specific pages or a "class electronic home message notebook" that contained class-specific news and links to news for the parents' association.

Well, it's surely a good practice to have, right here on the front page, very clearly, this most essential stuff because when you visit the pages, that's what you look at first. And it's good that these things that are common to the whole school are here on the front page and clearly visible so if you got more than one child, and that the home message notebook is shown and I also like that the parents' association pops up from there immediately like that. (Parent 24)

Materials. Storage and distribution of school materials was mentioned as a possibility for ICT use in HSC. School materials include forms, materials for parent meetings, contact lists, exams, schedules, and archived communication (i.e., monthly newsletters and letters from the principal). This material could be stored in folders on class pages for the current school year, thus making those items accessible to everyone in the class community at any time and from anywhere.

We have created subfolders in the project folder of the home message notebook, for example, parents' meeting, contacts, exams and timetables. Under each month, we have collected all the notifications for the month in question, for example, letters from the headmaster and the classes' own notes. (Teacher 3)

Direct messaging. The possibility of using ICT to support communication in quick-changing situations and regarding urgent issues was studied, specifically the use of voice call and text messaging features of mobile phones, as well as the use of email.

Students and teachers mentioned the importance of a class-specific phone number for handling urgent issues. With a class-specific phone

number, parents could easily contact a teacher or student regarding urgent matters by simply using a normal mobile phone. Text messaging was identified as especially useful for messages and call-back requests, as a teacher normally cannot answer phone calls during the school day. The class-specific phone could be the teacher's personal mobile phone number, or, since the phone would be primarily used only to receive text messages, a dedicated phone with a cheap prepaid plan could be utilized. Their value was noted by the respondents: "Classes' own phone is of primary importance in taking care of urgent matters" (Parent 26); "Text messages have been sent on urgent issues" (Teacher 2); "The ability to communicate using text messages if, for example, something that needs urgent communication came to mind after the students left school for the day" (Parent 24).

The possibility of using email was identified, especially because mobile access to email is increasing with smartphone use. Additional identified benefits of email use for direct messaging included the ease of sending email messages to a group and the fact that a recipient can easily auto-forward any incoming email messages to another email address, for example, to a separate mobile email account.

Scheduling. Scheduling was identified as a key possibility for ICT use in HSC. During the study, each class had its own class-specific page (i.e., "electronic home message notebook") in the WBLE. This page could also be used to share the weekly class schedule. With a shared schedule, students and parents could check the planned events for the next week and specifically keep track of deviations from the daily routine. We also identified possibilities for using class-specific pages to schedule parent meetings and chat discussions.

Our idea is that we will have the list of the week's activities on the front page. Parents can see there directly the most important things they need to know each day. So that for each day information is added, what happens that day, if there is something special on that day, like something out of ordinary? And gym and such have been always put on there so that parents always know what gym gear the students need to bring. And this has been really really good. (Teacher 2)

Others noted, “Book a time for example, for a chat discussion. One could set aside some slots in the teacher’s diary after the teacher has allocated those” (Parent 42), and “The booking of the time for the parent-child-teacher meeting etc. could be done through Opit” (Parent 42).

Student-specific information. Several possibilities were identified for ICT use in the two-way sharing of personal student issues. Both teachers and parents mentioned possibilities for daily collaboration, for example, informing the teacher of a student’s absence or an urgent need for the teacher to contact a student’s parents during the school day. Text messages, email, and tool combinations were mentioned as possible uses of ICT in this context, “In my opinion, email and the classes’ own phone have worked well and also of course, text messages from the school” (Parent 3), and

Also, the text messages by us have currently been such that if we know that we would not be able to reach a parent by email but that the parent’s phone number is there, then we may have written a short one like that for example, that the student got into some quarrel in the school and that they will be bringing a message home in their backpack. (Teacher 1)

Participation

Pictures and videos of schoolwork. The possibilities for using ICT to support participation were mentioned. Students, teachers, and parents provided ideas regarding the use of picture and video sharing to support participation. We identified the fact that with these tools, parents can get a better understanding of a student’s daily work in school: “Someone could take photos or videos during class and then show, for example, in the home message notebook, what they have been doing during the school day” (Student 32), and

Sharing the everyday school activities with homes has become richer with ICT. Parents can use ICT tools to follow the contents of class activities (stories, pictures, videos) in their child’s class and also the content created specifically by their child. (Teacher 2)

Further, possibilities for using mobile ICT equipment were identified. Students, teachers, and parents could carry mobile equipment with them, for example to school events or when traveling with the family during the school term. Using their own ICT equipment, it would be possible for students to share pictures and narratives from their families' remote travel locations, as well as remotely participate in schoolwork: "We have seen the photos to be a nice addition. Also, the photos taken by parents can be used, like we did with the school Christmas party" (Parent 30). Additionally,

People travel a lot nowadays and take vacation trips also during the school term and not only during breaks. Modern technology would make it possible, for example, that the student would, while still traveling, send pictures and narrative and their possible pre-assignments back to the school. (Parent 30)

The role of students in using ICT for participation was mentioned. Students can, with the help of a teacher or a school assistant, share their daily activities with parents and other stakeholders in the school community through a blog or network diary.

Other school stakeholders can also use ICT to support participation. Parents mentioned the possibility of participating in the school community through a blog written by the principal or through the webpages of the parents' association.

Scheduled remote participation. Several possibilities for using ICT for scheduled, real-time, remote participation were identified. Both students and parents mentioned the possibility of providing live feeds from the classroom, allowing parents to participate in the classroom activities remotely, in real time: "It would be great to maybe get a real-time picture from a classroom during a lesson, but that would need permission from all parents" (Parent 8).

A real-time feed and chat could also make it easier for some parents to participate in parents' meetings and other gatherings:

A real-time net conference could make it easier for some parents to participate. All the participants see who is present, (like in a physical classroom). The discussions would be recorded and stored under projects so that anybody could watch them at any time. (Parent 55)

Another parent noted, “We could make use of chat in the parents’ meetings; if you cannot attend, there could be a chat person at the location who runs the chat between those present locally and those attending remotely through chat” (Parent 42).

The possibility of recording scheduled sessions was identified, which would effectively transform them into an unscheduled form of participation for parents who cannot attend a scheduled session. The recordings could be made available for parents in folders on the class-specific pages of the WBLE.

Unscheduled remote participation. Ideas for using ICT in non-scheduled, non-real-time remote participation were identified. A discussion forum was suggested for participating both in the daily schoolwork and in parents’ association activities. ICT use was identified as a way to lower the entry barrier for parents who do not currently participate in these activities:

There could definitely be one for discussion for the parents of the whole school, for example, on the activities of the parent’s association. It could be one that would touch everyone and maybe also reach those families who have not dared to participate in the parents’ association or don’t know about it. Now, this could be like a channel for communication. (Teacher 2)

ICT-based survey and questionnaire tools could be used to provide responses during remote participation, as well as to collect various types of feedback. Possible uses include sharing feedback on the suitability of homework, distributing surveys on home rules and practices, identifying preferred forms of collaboration, and sharing parents’ views on their children’s schooling.

Sharing of views and opinions. Possibilities for using ICT to share the views and ideas of the stakeholders in the school community were identified. For example, teachers, special-needs teachers, students, the headmaster and members of the parents’ association could share their thoughts through blogs, “How about a blog by the teacher? And especially by a special-needs teacher?” (Parent 8). Students had novel input:

Well, yes, and everyone could have one of their own that they could put there, like exams, and there could be like one of those school blogs, or, for example, in our class, we have like school blogs we used to write every Friday. (Student 46)

And, parents noted other uses: “The headmaster could use Opit to share more of their opinions. We’d love to read those” (Parent 49); and “The parent’s association and class can already get their message heard more easily than before, but we could make even more use of this: pictures of happenings, a blog by the chair of the parents’ association, etc.” (Parent 30).

Parent-led activities. Parents can use ICT in parent-parent collaboration, or in activities organized by parents. The specific possible ICT uses included storing minutes of the class parents’ committee meetings and other materials on class-specific pages, as well as making use of a discussion forum for parent discussions on education and upbringing.

Well, I think that trying to get a discussion going would be good, it could be chat or whatever but that parents could really discuss things there. For example, ponder some ideas about child upbringing, bedtimes and such, and discuss these with other parents so that parents would find it a bit like a parent café type of thing. (Teacher 2)

Learning Support and Personalization

Personalized learning. Several possibilities for using ICT to support learning were identified. To support a student’s learning, the teacher could link exercises to the class-specific page or create learning modules in the WBLE. The student could use these tools for personalized teacher-guided practice so that the student could work at home on their own or with their parents.

Through the class-specific page in the WBLE, the teacher could also provide guidance and tips for use in free time or during school holidays. Using these tips, parents would be able to support the student at home, “Learning modules created under projects support the

child's learning and make it possible to exercise more also at home, either supported by parents or without them" (Teacher 2).

This stuff has been added there as a bit like something to do during summer, something for the rainy summer day... there is Finnish and math, and then, we had their book recommendations, and then, we intend to put there still these like games and such. (Teacher 3)

ICT use was identified as a key enabler in terms of providing personalized learning for each student. Teachers mentioned the possibility of having a personal page or electronic home message notebook for each student in the WBLE, as well as the possibility of creating groups of exercises to support personalized learning. Further, they mentioned the possibility of using the student's personal page to provide personalized guidance and feedback.

If each student had their own personal home message notebook, one could place their personalized exercises there, which they could work on together with their parents. The teacher could place personalized guidance and feedback on the web pages. (Teacher 4)

Mobile schoolwork. The use of ICT to manage learning content, homework, and remote school assignments was suggested. This would allow a child who is on sick leave or traveling with their family to keep up with their schoolwork: "Teaching and homework on the net. If the child is sick or traveling, the teacher could assign homework using the computer" (Parent 42).

Student portfolio. The use of ICT to allow parents to follow their children's progress in school—and general growth—was suggested by parents and teachers. The key concept suggested was a student's personal page or portfolio in the WBLE, which would grow over time and include content such as the current goals agreed upon with the student, the student's schoolwork and creative work, the student's self-evaluation and personalized teacher guidance and feedback, as well as feedback from the parents.

Yep, we have given some thought on that it would be good if this could become a bit like a portfolio-type home message notebook for

each child. It could contain that learning progress and self-created stuff there within the child's own home message notebook so that the parents could see them and the children could also look up their work. This way, they could even try something like process writing and such and continue even at home and then store the stuff there in their own home message notebook, in their own folder. (Teacher 2)

One parent noted: "One could find in the student's own folder more information on what has been done in the school, especially what has been exercised and how was the progress" (Parent 33).

Student email. With the use of ICT tools, including email, in HSC students can become familiar with having their own email accounts and learn, together with their parents, how to use their email accounts responsibly, "During the fall term, students got their own email accounts and we have provided instructions for and used them also for home and school communication" (Teacher 2).

Social learning. Several ideas about using ICT in collaborative learning were generated. Through the use of ICT tools, a class could share their collaborative work and activities (e.g., pictures and videos) with the entire class community. ICT tools make it possible for students to share the skills and knowledge they have acquired outside of school with their schoolmates, their teacher, and their parents:

Students had a chance to perform their own experiments, which were then shared with the whole class. For example, the idea to create a cartoon animation started from an idea one of the students picked up from Metkula [a learning environment in which children can practice media literacy skills]. After it was shared with the class, the students started creating their own animations at home as well. (Teacher 2)

Supporting Learning at Home

Homework. Teachers, students, and parents mentioned several possibilities for using ICT to support learning at home. Several parents expressed the wish to see the homework for the day on the class-specific pages or the electronic home message notebook. They would like to use this information to support the child in completing their homework. The same use case was also brought up by a student. Students feel that it would be good if their parents knew about their homework and could support them in completing it.

We could have, to the extent possible, have notes in Opit for each child on areas that could use practice at home. Sometimes, it feels like it would be good if parents could check even daily the homework by checking the student notebook of a child with a poor memory. (Parent 18)

This is the way that parents can in a way follow what's the homework. If someone comes home from school and has a hobby and homework is not interesting: a student is saying "no we didn't get any homework" and then they actually have a backpack full of that homework, so in a way the parents also can follow things. (Student 46)

Exam preparation. The possibility of using ICT to support exam preparation at home was mentioned. For this purpose, teachers could use class-specific pages to share additional preparation material that the students could work on by themselves or with their parents.

We have placed folders for school subjects into the front page exercise folder and collected in the folders Opit exercise materials on the things we are learning. The students have worked on these exercises especially when they are prepping for exams. (Teacher 3)

Parent support. ICT use was identified as a way to help parents help their children in their learning. Through the use of ICT tools, a teacher can guide both students and parents through a learning topic. For example, as the method of long division has changed since parents were in school, they mentioned that it would be good if they could watch a video recording of the teacher showing the students how to use the current method. After learning the new method themselves, the parents could view the video again to review the topic together with their children and, equipped with up-to-date knowledge, help their children with their math homework.

If a child needs help with their homework, especially on some specific thing, parents could get instructions for that. For example, in math the techniques (long division etc.) have changed and one finds out that one can't help the child without first learning the new technique oneself. (Parent 30)

Teachers identified ICT tools as having the ability to provide guidance and convenient links to help parents in finding the correct exercises to work on with their children.

Actually, today, as one little girl was like "I don't know how to tell Mom how to get to those games", we put there in the home message notebook like links for like from here and then like just in case, I mean Jill told that that she doesn't know how to tell you; do this and step 1, step 2, sign into Opit and such. (Teacher 6)

Evaluation

Continuous evaluation. Several possibilities regarding the use of ICT in evaluation were identified. One key use case that was strongly mentioned was implementing continuous evaluation by using the student's own page or portfolio: "Gathering a portfolio, where students set their own goals and then evaluate if the goals have been met" (Teacher 1), and "It would be awesome if one could follow so closely their child's work and progress in school subjects – even every day" (Parent 5).

Self-evaluation. The study school integrates self-evaluation in its activities, including a special evaluation week within each school term. The evaluation week begins with each student completing a self-evaluation form that they first discuss with their parents and later with the teacher in a student-parent-teacher meeting. The discussion with the teacher includes strengths and areas for improvement that are noted on the form as the student's goals.

The possibility of using ICT to support self-evaluation activities was identified. Specifically, participants suggested the use of an electronic version of the self-evaluation form that could be stored in the student's own page for easy reference. "We could also fill out the self-evaluation forms electronically, and they could be stored in the student's own folder" (Parent 24). "For our school, moving the self-evaluation form into an electronic format. Once again, gathering a portfolio; including also setting own goals and pondering if the goals have been met" (Teacher 1).

Evaluation meetings. The possibility of using ICT for the student-parent-teacher meetings was mentioned during the evaluation weeks. Using a remote meeting tool would allow more parents to take part in these key collaboration opportunities. "We could use computers in evaluation discussions, for example, by using Skype for the discussion in case the parent just can't manage to visit the school for the conversation" (Teacher 3).

Exams and quizzes. The possibilities of using ICT for exam preparation included providing information about upcoming exams on the class-specific pages, along with associated preparation materials and support for parent use to help their children with exam preparation. With the quiz and assessment features of WBLEs, teachers can create online exams and quizzes. As the results of these are readily available online, parents can review the results with their child and support and guide them in areas they find challenging.

We have placed folders for school subjects into the front page exercise folder, and collected in the folders Opit exercise materials on the things we are learning. The students have worked on these exercises especially when they are prepping for exams. (Teacher 3)

In our class we have it so that when people take an exam they don't always bother to read the book so we've got first in Opit all of these exercises and there's also sometimes been links in the home message notebook. (Student 46)

I wonder if there could be some exams or quizzes or such so that they would be visible. And that you could in a way browse them in case there's something ... like talk with the kids like how come you didn't get this ... maybe at that point teach them and see what are in a way the weak points with the kid. In a way somehow you could there like help with that. (Parent 35)

Parents also mentioned the possibility of storing the results of traditional evaluations and exams online for the identification of trends and areas in which a student needs support. "It would be easier to file evaluations and exams electronically and to follow progress in areas that have been agreed for further development" (Parent 30). "If the teachers have time, it would be good to always have exam grades in a single place there in Opit. This way, it would be easier to stay up to date and follow the child's progress" (Parent 5).

Teacher feedback. ICT was identified as a means for teachers to provide feedback to students. The teacher could provide feedback on the student's own page or along with the exercises stored on the page. Parents also mentioned that they would like to use the student pages to see the teacher's mid-term evaluations, as well as teacher notes on areas parents could help with in the students' learning. "The teachers could from time to time put in the kid's profile some things about the school, I mean how they are doing in school etc." (Parent 5). "The teacher could place some personalized guidance and feedback on the pages" (Teacher 4).

Parents' feedback. The possibility of using ICT to provide feedback was also identified in the other direction—feedback from parents. A teacher mentioned that the feedback features of the WBLE could be used by parents to provide feedback to a student through the student's own page, as

well to the whole class through the class-specific pages. “We did not have time to use the parent feedback function in Opit to evaluate students’ work. The feedback function was not available during the work weeks. We’ll begin using it as soon as possible!” (Teacher 2).

Possibilities for Using ICT in HSC and the Six Types of Home and School Involvement.

In Figure 3, we introduce a map of the categories of ICT use in HSC identified in this study to the types of home and school involvement defined by Epstein et al. (2009). From the mapping, we see that ICT use possibilities are not limited to communication (Type 2) but do extend to various other types of home and school involvement.

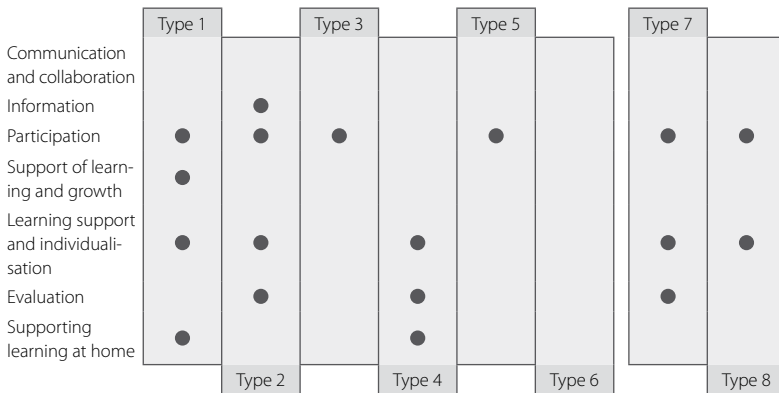


Figure 3. Mapping of ICT use possibilities to the types of home and school involvement

We identified two new types of home and school involvement: learning at school and learning in free time. Following the conventions of the Epstein model, we refer to these new types as Type 7 and Type 8, respectively. We see that the two new types of home and school involvement can be

practically apply the use of ICT tools so parents can actively participate in their child's learning at school. ICT use also makes it possible to extend the child's learning experience to their free time or playtime, beyond traditional homework and learning at home.

Further, we note that the results of this study do not indicate ICT use possibilities for collaborating with the community (Type 6). We see this as a limit to the scope of the study because it did not involve participants from the larger community (for example, the student welfare team, nearby libraries, and other community members) and suggest that another study could target ICT use possibilities for this involvement type.

We see that the use of ICT in HSC can support the existing types of home and school involvement, as well as create new types of HSC. ICT offers possibilities to enhance and extend the ways in which parents can participate in activities in the school, as well as in supporting the learning and growth of students.

Discussion

Key Results

In this paper, we have reported a number of possibilities that teachers, parents, and students identified for ICT use in HSC.

The possibilities with a focus on communication and interaction were classified into two main categories and several subcategories: information (news, materials, direct messaging, scheduling, and student-specific information) and participation (pictures and videos of schoolwork, scheduled remote participation, unscheduled remote participation, sharing of views and opinions, parent-led activities).

The possibilities that focused on the support of learning and growth were classified into three main categories and several subcategories: learning support and personalization (personalized learning, mobile schoolwork, student portfolio, student email, social learning); supporting learning at home (homework, exam preparation, parent support); and evaluation

(continuous evaluation, self-evaluation, evaluation meetings, exams and quizzes, teacher feedback, parent feedback).

The results of the study indicate that ICT use provides possibilities for crossing the traditional boundaries of HSC. Through the use of ICT, new innovative ways of engaging in HSC can be implemented in practice. The use of ICT offers new possibilities for collaboration and communication between students, teachers, and parents, as well as to support the individual student's learning and growth. In short, teachers and parents can work together to support different types of learners.

The use of ICT opens new methods of involvement for teachers and parents. Many of today's parents are very interested in what happens in the school, and teachers would appreciate support from parents. The results of this study indicate that ICT use can enable parent participation in everyday schoolwork (Type 7, learning at school).

Today's students learn everywhere and make extensive use of ICT in their free time. The results of this study emphasize the possibility of using ICT to learn during their free time (Type 8, learning in free time). When a student engages in learning activities during their free time, ICT-based HSC enables parents and teachers to learn about a child's interests, knowledge, and skills and can make use of this information to support the child's individual learning and growth.

Each of the three stakeholder groups in this study (students, parents, and teachers) has their own viewpoints about schooling and education. Teachers are responsible for supporting student learning and growth according to the objectives set in the national and school-level curricula. Parents seek information about the learning and growth of their children, but they lack access to detailed knowledge about the curricular objectives. Optimally, students also have a general understanding of the objectives and are working towards them. Therefore, an essential goal of HSC is to support parents and students in recognizing the objectives and in achieving them. Several possibilities identified in this study (e.g., the possibility of focusing on homework and evaluation) can support students and parents in reaching this goal.

Recommendations

To make the possibilities of ICT use in HSC a reality, we recommend a number of actions targeted at the key aspects of the adoption process that have the potential to affect the outcome of adoption.

Based on the results of this study, the focus of HSC improvement should be placed on participation, working together with all school stakeholders, empowering teachers, students, and parents in voicing their ideas about ICT use and providing them with the practical support they need to implement ICT as a part of their collaborative practices. When preparing requirements for ICT vendors, IT managers should consider use cases derived from the ICT use possibilities identified by these practitioners.

A prerequisite for ICT use in HSC is that all participants have access to a workable level of ICT technology, including devices, software, and connectivity. Today, most Finnish homes, students, and parents possess equipment that is equivalent or better than what was used in this study. However, there should be additional focus on improving the usability of the currently available systems and tools, as that usability will contribute to the adoption of HSC innovations based on those systems.

Of the local environment factors affecting the adoption of HSC innovations, the current bottleneck is with the ICT facilities provided by the school for teacher use. Teachers currently use their own ICT equipment (e.g., mobile phones, prepaid cards, and laptops) to support their HSC needs. For the success of ICT use in HSC, it is crucial that the employer support the teacher with standard personal tools required by today's information worker.

In addition, the adoption of ICT innovations at schools may require a cultural change in ICT use at the school; ICT facilities in schools should move away from a PC classroom model towards equipment that can be used in the use cases indicated in this study.

Finally, to ensure the external environment supports ICT adoption, the identified possibilities of ICT use in HSC should be recognized when planning school operations and resourcing at the school, communal, and national levels, and teacher education.

Acknowledgments

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3 Crossing Classroom Boundaries Through the Use of Collaboration Supporting ICT: A Case Study on School – Kindergarten – Library – Seniors' Home Partnership

Minna Kukkonen and Jari Lavonen

Abstract

A new model for school-community collaboration (SCC) is needed to support students' sense of community and 21st century skills. In this study, SCC was developed and researched through the iterative-design-based research (DBR) approach, in which teachers and out-of-school collaborators, students, and researchers collaborate in real learning situations. The use of information and communication technology (ICT) in the collaboration was considered an innovation adopted by the practitioners. The aims of the study are to research the collaborators' expectations of and experiences with SCC and show how they may utilize ICT to support student learning. An action team for partnership (ATP) was created and activated within the framework of Epstein's (2011) theory of school partnership programs. Students were active on the action team. The adoption of innovation was analyzed in the context of Rogers's theory on the adoption of innovations to assess practitioner participation in learning within collaboration. The data — focusing on partnership and student learning — was gathered in multiple ways, including questionnaires, interviews,

and the analysis of artefacts (e.g., journals created by students and videos). As a result, the expectations and requirements of collaboration, descriptions of ATP in action, and examples of ICT use in school-community collaboration and student learning are presented. Through an action team and ICT, it is possible to support school-community collaboration, which in turn aids student learning and the development of life-long competences by crossing boundaries in learning. The outcome of the DBR will be artefacts, such as a new model for SCC and guidelines for ICT use in collaboration. This research is part of the Finnable 2020 project to design activities that support and enable students to cross boundaries.

Keywords: Collaboration, Crossing Boundaries, Diffusion of Innovations, Collaboration Supporting ICT

Introduction

This study promotes SCC through the use of ICT, which supports collaboration. The aims of the study are to research the collaborators' expectations of, and experiences with, SCC. Moreover, a focus is on how school-library, school-kindergarten, and school-seniors' housing collaboration may utilize ICT to support students' learning. It is needed to determine ways in which the community can help students learn, collaborate, and operate in the twenty-first century. Collaboration supporting ICT will be used and developed during this study. The project was implemented in one school and its nearby collaborators in Finland in the capital metropolitan area.

Actions, Participation, and Collaboration

In this study, students engaged in learning and collaboration at various SCC sites. In this process, students grew to be part of the community culture, including its value base, practice, and tools. Through this interaction, the students learned to control appropriate thinking and action tools in the community. The key role in development and growth is the interaction between the environment and its tools (such as ICT tools), the community, and students (Kumpulainen et al., 2010).

In SCC sites, students change and adapt conceptual and procedural knowledge through actions, participation, and collaboration. The starting point of the community participation is an action that is mutually agreed upon and supported (Wenger, 1999). Actions are supported by a variety of practices, tools, concepts, and language. Shared actions involve the community members, students, teachers, and representatives from the sites. Learning occurs as a collaborative process that adjusts through the actions of individuals and communities in various environments and conditions (Säljö, 1994).

In a community, knowledge and skills should be learned in order to operate within that community. However, these competences cannot be learned merely by following. Active participation and collaboration are required. Individuals have their own needs and aspirations. Through constructing SCC and operating in them, we can learn to utilize the diversity offered and take advantage of data resources, expertise, and life experiences. Active participation, agency, and life-long learning skills are important constructional elements in a good life for an individual and the whole of society.

A school is an organization with the task of guiding students to achieve knowledge and skills that will allow them to successfully participate in society and develop life-long 21st century competences (FNBE, 2004). Therefore, a school should ensure that it provides bridges between various kinds of learning environments and that it supports crossing the boundaries that are easily built around the school. It cannot detach too greatly from the outside world (Kumpulainen et al., 2010).

Within the frame of the national level and school curriculum (FNBE, 2004), teachers aim to provide opportunities for students to learn and accumulate knowledge and skills in various contexts or learning environments. In these contexts, ICT can create new dimensions of interaction, collaboration, and learning (Laru, 2012). Computer-supported collaborative learning (CSCL) is based on the idea of developing new applications and software to create explorative activities and social interaction. CSCL combines the use of ICT and education, collaborative learning, and computer support. It has several approaches, such as e-learning, online teaching, posting study content, and collaborating face-to-face. Collaboration takes place while browsing information on the Internet, during discussions, or through the presentation of findings (Stahl, Koschmann, & Suthers, 2006).

Laru (2012) highlights the importance of guidance while using different devices like ICT tools. According to him, enhancement of learning processes can be facilitated through offering supportive collaboration environments and tools for students. Collaboration requires that participants share aims, are coordinated, and engage in problem-solving (Laru, 2012).

Adoption of Innovations

Another theoretical framework of the study is based on Rogers' (2003) theory on diffusion and adoption of innovations. According to Rogers (2003), an innovation is an object, idea, or practice that seems new to an individual. An innovation may also be something one has known for some time, but has not yet developed an attitude towards it, adopted it, or rejected it (Rogers, 2003).

In this study, the innovation is SCC where ICT is used. Use of ICT in education—especially in SCC—as an innovation consists of the use of appropriate hardware and software. Use of ICT usually has some benefit for its potential adopters, even if it may create uncertainty about the consequences. During the adoption process, the adopter is motivated to reduce this uncertainty. In this study, an ATP was created to decrease this uncertainty. Moreover, the activities were planned in collaboration with

the adopters, and the use of ICT was practiced together. The adoption process consisted of stages, beginning with hearing about an innovation, to the final stage of persuasion. Whether or not the decision is adopted, it is implemented and finally leads to confirmation (Rogers, 2003).

Rogers (2003) defines a champion as a person who throws their weight behind an innovation. The role of a champion is to bolster a new idea within an organization, initiate the innovation process, and guide the approval and implementation of the new idea within the organization. The presence of an innovation champion contributes to the success of confirming the idea. The champion need not be a top manager. Although Smith, Redican, and Olsen (1992) formulate an administrative innovation champion positive, Day (1984) found a powerful innovation champion is needed when the innovation is costly, highly visible, or radical. Champions play a role as an opinion leader in a community, and they help fit an innovation into the organizational context. Based on many examples, Rogers (2003) suggests that innovation champions come in all ages and have various abilities and degrees of formal power (Rogers, 2003).

The adoption of an innovation in an organization is more complex when compared to the process that an individual goes through in the adoption process. An individual cannot fully adopt an innovation until an organization has adopted it. There are innovation adoption processes going on all of the time in most organizations, and this is a fundamental characteristic of organizations. Implementation amounts to the adaptation in which the change of both the innovation and the organization occurs (Rogers, 2003).

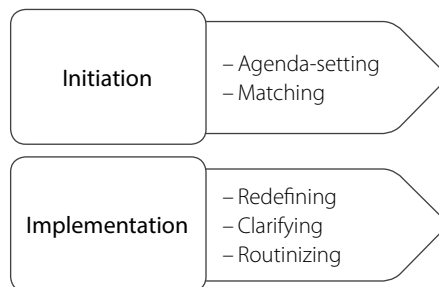


Figure 1. Phases of adoption of an innovation within organizations, according to Rogers' (2003) theory.

Figure 1 reveals that the adoption of innovation consists of two main phases divided into five stages. During the initiation phase, the adopter goes through all the information-gathering, conceptualizing, and planning stages, which are all essential for the adoption of an innovation. The adopter makes decisions that consider the adoption of the innovation. Sometimes knowledge related to the innovation launches the adoption process. During the agenda-setting stage, the needs, problems, and issues are identified, and onwards, an innovation is set to cope with the needs and context of the organization. During the matching stage, the organization's agenda is compared to the innovation. In an optimal situation, the innovation matches some needs within the organization and some individuals recognize the innovation as a possible solution to those needs. Adoption will likely occur if the innovation effectively matches the organization's needs (Rogers, 2003).

The first stage in the implementation phase is redefining. During this stage, the innovation is re-invented in order to accommodate the organization's needs and structure more closely. Both the innovation and the organization will change or adopt new characteristics during the redefining stage. During the clarifying process, the innovation will become clearer to the organization's members. Clarifying requires sufficient time to make the innovation familiar to ensure rejection of the innovation. The meaning of the innovation is constructed through an interaction. In implementation process, the innovation champions play an important role. While the innovation has been routinized into a part of the regular activities of the organization at this point, the innovation has lost its separate identity and the innovation process is completed. Participation of the organization's members in the innovation process makes sustainability of the innovation more likely over time. While adopting an innovation, organization members will modify the innovation so they come to regard it as their own, and thus will more likely continue to do so over time (Rogers, 2003).

Epstein's Models for School–Community Partnerships

The framework of the study is based on Epstein's (2011) school partnership model (i.e., SCC). According to this model, the community is important for the success of partnership programs. Epstein defines community to include family and the school, and extends to the neighborhood, the city or township, and all of society. According to Epstein, every school, district, or state must identify with its community and design productive connections that will strengthen school programs and advance the interests of the community. The main purpose for SCC is to help all youngsters succeed in school and later on in life. Students are at the center of the SCC. It is important to activate students to produce their own successes by engaging, guiding, energizing, and motivating them in designed activities (Epstein, 2011)

Epstein (2011) suggests an action team for partnerships (ATP) to improve plans and practices and to guide development linked to school improvement goals. The idea of ATP is close to the idea of a champion as defined by Rogers (2003). In addition, Epstein identifies five steps for developing positive SCC (i.e. school, family, and community) collaborations. Identification of the five steps is based on the efforts and insights from hundreds of schools (Epstein, 2011).

Table 1. describes the steps towards appropriate and successful SCC based on Epstein's (2011) theory. Epstein defines ATP as an effective way to build school partnerships. The ATP should include members of different entities extensively, and it is important to include at least one member from the school council, school improvement team, or other advisory group. A diverse membership ensures various needs, interests, and talents are taken into account. The chair or co-chairs of the ATP should have the respect of the members, good communication skills, and understanding of the SCC claims. An extensive team ensures that the responsibilities can be shared and that plans for partnership will continue even if members move or change positions. Funds are needed for various costs, such as salaries, staff development, and training workshops. In addition, to do its work, the ATP requires explicit support from the principal and district leaders for time for team training, meetings, program evaluation, and conducting the activities (Epstein, 2011).

Table 1. Five Steps to Develop Positive School, Family, and Community Connections, According to Epstein (2011).

Steps towards positive connections	The key issues
Create an ATP for Partnerships (ATP)	takes responsibility for <ul style="list-style-type: none"> • assessing practices • organizing options for partnerships • implementing activities • delegating leadership for activities • evaluating steps • continuing the improvement of practices takes leadership or support roles
Obtain Funds and Other Support	a budget to <ul style="list-style-type: none"> • guide and support the activities • support the salaries of a director and facilitators • provide for program costs time and social support
Identify Starting Points	gathering information about <ul style="list-style-type: none"> • current practices • views, experiences and wishes • ideas
Develop a One-Year Action Plan	a set of selected goals specific involvement activities schedule responsibilities costs evaluation
Continue Planning, Evaluating and Improving Programs	an annual presentation and celebration a new One-Year Action Plan

Research Questions

The first aim of the study is to find out the collaborators' expectations of SCC. These expectations are taken into consideration while planning the collaboration and assessing the needs for collaboration. Secondly, experiences with SCC and ICT utilization are being researched. Ways of using ICT in collaboration are in focus. Students' participation and action in collaboration are important while finding out how students adopt ICT as an innovation. The research questions are:

- Q. 1. What are the collaborators' expectations and experiences with SCC?
- Q. 2. How is ICT used in SCC between school, kindergarten, library and seniors' home?
- Q. 3. How are students adopting ICT as an Innovation in SCC between school, kindergarten, library and seniors' home?

Method

According to Epstein's (2011) model that describes SCC, an ATP is needed. Therefore, an ATP was established by the chair of the activity. The ATP in this study consisted of two groups: an adult's team and a student's tutor-team. The chair for the ATP is a teacher who is a researcher and member of the school management team. In this study the ATP was established by inviting representatives of organizations located near the school. The organizations were selected based on their location and their (positive) attitude towards collaboration. The managers of the organizations were contacted and invited to join the collaboration. Through involvement of the managers, the authority innovation-decision was made, which others in the respective organizations must comply with, according to Rogers' (2003) theory. The managers appointed team members to the ATP from within their respective organizations. These individuals were akin to local champions, throwing their weight behind the ICT as an innovation.

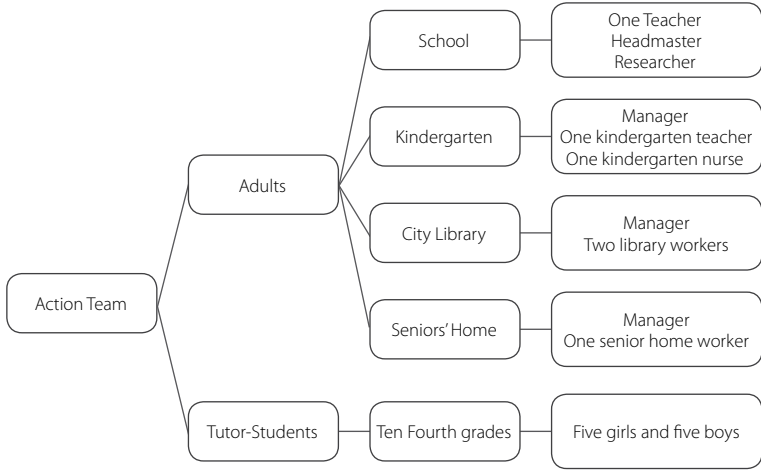


Figure 2. The ATP in school collaboration in practice.

Figure 2 describes the team structure and members. The tutor students were chosen by means of inclusive learning. The school participating in the SCC was involved in the team teaching model used. Mainstream students, special needs students and their teachers, special needs teachers, and assistants cooperated in various ways. In the fourth grade, there were 63 students, 4 teachers, and 2 assistant teachers in the classrooms. The tutor students were individuals who were responsible, capable of studying independently, and possessed good interaction skills. The tutor students were chosen by their teachers. There were an equal number of girls and boys on the tutor team. The adult team included both male and female members. All members of the ATP were considered to be the boosters of ICT use in collaboration—also known as “champions” in the frame of Rogers’ theory on adoption of innovations. Their role was to initiate the innovation process by guiding and implementing the ATP ideas and goals within their respective organizations. The actions were planned taking into consideration Rogers’ (2003) theory of adoption of innovation and Epstein’s (2011) theory of school partnerships. These theories facilitate the planning and implementation of the activities organized in the environments in accordance with the aims of the collaboration.

The study follows DBR methodology. DBR requires the collaboration of practitioners and researchers in real teaching and learning situations, as well as the creation of prototype solutions based on the aims and agreed-upon design principles. DBR increases the capacity for designing educational innovation that could also work in practice. Research proceeds in iterative cycles. DBR explores possibilities for creating novel learning and teaching environments and develops theories of learning and instruction for different contexts. It also advances and consolidates design knowledge (Van Den Akker, Gravemeijer, McKenney, & Nieveen, 2006). The designed activities—where the tutor students play an important role in SCC and act as experts—were observed. Both the students and partners were interviewed and asked to answer (paper and pencil) questionnaires. The researcher kept a field notebook with descriptions about the use of ICT in SCC (e.g., how students used ICT, successes and difficulties experienced in different situations). Notes during the meetings were recorded in the field notebook. Through the analysis of the data, new knowledge about the adoption of SCC and use of ICT in this SCC were obtained in the framework of Rogers' (2003) theory, while considering the adoption of innovations.

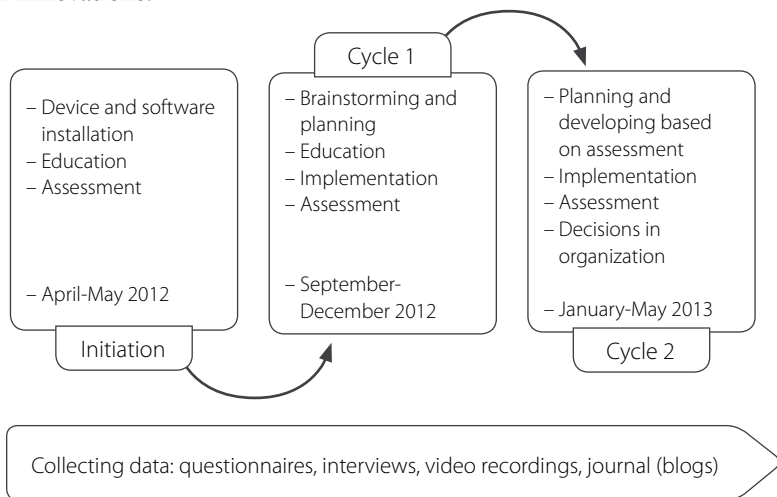


Figure 3. Designed cycles to support the adoption of innovation, according to Rogers' (2003) theory in practice.

Figure 3 represents the adoption process for SCC with the implementation of ICT. The initiation process included the installation and familiarization of devices, such as SMART Boards, document cameras, and software, as a part of the SCC. SMART Boards and peripherals were installed in the seniors' home, city library, kindergarten, and school. The number of the facilities included in the study was assessed by the chair of the ATP and school management, considering the need to enhance activities based on need and practical issues. During the initiation, the chair educated the ATP on the use of SMART Boards and its Notebook software. Education was provided to the ATP during the entire implementation process, based on recognized needs. The tutor students received the most instruction to allow them to share their newly acquired knowledge with their schoolmates and the ATP members. Two cycles of implementation were monitored relative to the school year periods. The expectations and need for collaboration were identified. Goals and actions for implementation during the cycles were planned jointly with the ATP. The first cycle was assessed collaboratively and included reflection on the video recordings and photos taken during implementation. Based on the experiences, expectations, and needs from the first cycle, the second cycle was planned and goals were set collaboratively.

Multiple sources for data collection were utilized, as is characteristic of DBR. Mixed methods were used in data analysis. The questionnaires included open-ended questions and a Likert scale. After each action, the ATP members were asked to complete a questionnaire about the incident action. In this paper, we use the ATP members' responses to the open-ended questions from the questionnaires as preliminary data. The answers were analyzed in accordance with the principles of theory-driven content analysis (Patton, 2002). First, the content analysis began with themes related to Epstein's (2011) theory on collaboration (school-kindergarten, school-seniors' home, and school-library collaboration). And second, the ideas in Rogers' (2003) theory on adoption of innovation were followed. In practice, the data was analyzed based on the aforementioned theories (e.g., by determining how the ATP functioned within the new context of ICT use). We analyzed how students and collaborators were able to participate in ATP activities and learn to control appropriate thinking and

action tools (like ICT) within the community. The same categories or phenomena were searched in multiple data sources. Samples of responses to the open-ended questions and interviews are noted in quotation marks.

Results

The results describe representative examples of the ATP activities and implementation of ICT use in practice based on the collected data.

Expectations and Needs for Collaboration

Results of participant expectations and needs focused on four dimensions (as seen in Figure 4). The members of the ATP organized, learned, and interacted well, with fruitful support for future collaboration. They felt it was important to have a responsible leader—a main champion—who shared responsibility with all members and encouraged participation in

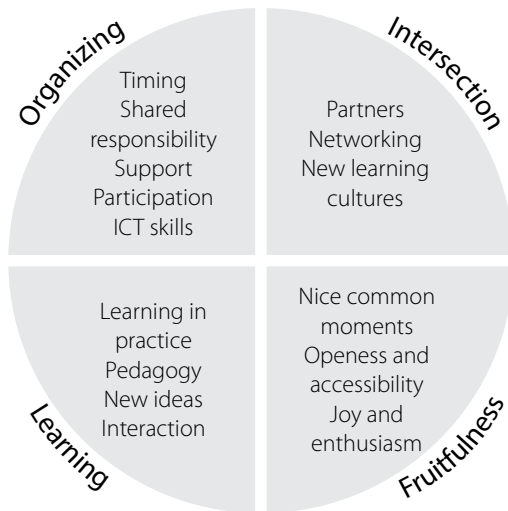


Figure 4. Expectations and needs for collaboration.

the collaboration. The ATP members' experience of interaction and collaboration was seen as fruitful, open, and joyful. They discovered new partners and experienced new cultures for learning.

Collaboration in Kindergarten

According to the notes in the field notebook, the ATP members used ICT in SCC (especially SMART Boards and document cameras) in kindergarten in variously performed everyday activities. The tutor students taught kindergarten children to create so-called electrical postcards that were decorated using Notebook tools, printed, and made into postcards. "Fourth graders taught preschool children how to make an easter card. At first, a fourth grader showed step-by-step how to make a card and then a preschool children made the same themselves." (ATP member 1)

Another example of tutor students acting as experts in kindergarten is their creation of games. Tutor students instructed the collaborators, including the ATP members and children in kindergarten, how to use a SMART Board to make visual memory games. Kindergarten children were asked to choose some of their toys which were scanned into a document camera and ported to the Smart Notebook software. A block to hide one toy at a time was calculated with Notebook tools. Children were asked to close their eyes while one child would cover up one toy; the other children were asked to identify the missing object. This game was called "Kim's game" and was redefined by tutor students and the chair to fit the use of SMART Board software in kindergarten. "Tutor-students taught kindergarten children to scan their own toys to SMART and then cut the pictures to make a Kim's game out of those toys," (ATP member 2) and "We scanned children's toys and made a Kim's game out of those pictures." (Tutor student 1)

Another memory game called "Pairs" was built using the lesson activity toolkit (LAT) available in Notebook. The toolkit consists of the ready-made activity layouts that can be edited by different means. Tutor students taught the ATP members to use this toolkit. The kindergarten members in the ATP used LAT tools with kindergarten children. They used web-based software like the Papunet game (<http://papunet.net/english/>), which

is easily redefined using a SMART Board and works with small children. Some kindergarten children and members of the ATP have taught the use of Papunet to school students using the conference system, Adobe Connect Pro, with the help of the chair. Adobe Connect Pro is used to send and share audio-video files of kindergarten children singing and reciting poems together with students from school to the organizations in collaboration.

In Kindergarten we have practiced to use SMART Board and Notebook (What the Board is? How to use it?) We have taken pictures of children with [the] document camera and used the photos to make a Kim's game. SMART is one alternative activity to choose when playing, and children play Papunet and other children's games. They also draw and watch and analyse pictures. We have also made anagrams and memory games with children. We have sent a poem and singing session with school and recorded it. We have also made an advent's calendar by using lesson activity toolkit. (ATP member 2)

Collaboration in the Library

The city library involved in the SCC is a modern library with various kinds of activities offered to patrons. The tutor-students have been involved in some of these activities. The library offers action days for patrons where tutor students have, for example, provided advice on the use of the SMART Board and its software. The patrons have been able to experiment with the functions discussed. Tutor students also taught patrons how to create electrical postcards; the patrons were able to produce them. The library's SMART Board is used to create animations in its children's animation club. The members of the club come up with stories and fairy-tales and illustrate them with drawings and paintings created with crayons and watercolors. These illustrations are scanned with a document camera and ported to the Notebook. With the Notebook tools, these paintings are made into an animation with the system that the chair of the ATP has innovated. Those animations are revised with movie editing tools. The document camera is used during storybook time to show illustrations from a storybook to

children. A library worker keen on table role playing games used a SMART Board in his role playing game club for youngsters. The Adobe Connect Pro conference system has been used to send and share concerts, ideas for finding interesting books to read, puppet shows, and other activities to make reading and culture attractive to all collaborating organizations.

Well we have had Niina Bell's children's concert, and there were about three hundred children in the library to listen to it. And moreover the concert was sent with Adobe Connect Pro to kindergarten and other partners. So there [was a] huge amount of listeners. So maybe a thousand of persons enjoyed the concert at a moment. And then there has been education and animation club in the library. (ATP member 3)

Collaboration in the Seniors' Home

In the seniors' home, the SMART Board was used to share student presentations created at school on multiple subjects. The created animations were shown using the SMART Board. The mobile devices (e.g., laptops) were used to share presentations and poems on Valentine's Day. Movies were produced using the iMovie application on iPads. Tutor students and senior citizens have played games together on the iPads. Mobile devices have been used to record interviews with senior citizens who tell about their life experiences and those interviews are then shared with the school.

In collaboration, the seniors in senior home have got activities. Each visit to [the] senior home has been very valuable to seniors. It has been really brilliant to use ICT tools with seniors. There is a huge need for this kind of collaboration. (ATP member 4)

Results on SCC

Results about the usefulness of the collaboration and experiences of the collaborators are provided below in table 2 as direct quotations that have been selected as typical responses.

Table 2. Usefulness and experiences of the collaboration.

Collaboration	<p>"Collaboration has been interesting, fun and motivating." (ATP member 5)</p> <p>"Activity has been planned and organized. The teacher and the students were eager to participate, as well as almost all involved partners." (ATP member 7)</p> <p>"Interdisciplinary collaboration is strengthened and shown its power." (ATP member 6)</p>
Students' Expertise and Interpersonal Skills	<p>"The students are great teachers and they precisely learn while teaching." (ATP member 7)</p> <p>"I think this is really nice and I would like to collaborate with elderly people and make them happy." (Tutor Student 1)</p>
Valuable Networking	<p>"I think it is important that the school's teaching will spread outside the school building and the school will collaborate with the surrounding society." (ATP member 7)</p> <p>"I think the collaboration is fruitful and I would prefer more [of] this kind of life-cycle thinking in our society." (ATP member 4)</p>
Management Support	<p>"The busy schedule and overlaps have been preventing the collaboration for my part. Some of the partners have not been able to participate. There have been some logistical problems and obsolete software." (ATP member 5)</p>
Keys to Success: Regular Meetings, Training, and Leader of ATP	<p>"This has been a very interesting and educational project. I have learnt new and versatile ways to use information and communication technology, especially SMART Board." (ATP member 2)</p> <p>"I was a chair and I showed and taught what I have learned." (Tutor Student 2)</p> <p>"This collaboration is really worthwhile." (ATP member 8)</p> <p>"Without an extra adult and leader, the action would have been impossible. The role of leader has been really important." (ATP member 7)</p>

Table 2 represents the experiences of the participants in SCC. The collaboration has been seen as interesting and successful. Well-organized action and meetings have been seen as the key successes of collaboration. The role of the leader has been important in terms of taking care of the content of the meetings, including the goals, which are set as a group. A well-organised schedule for meetings and training had an important role. Even if there have been some overlaps, most of the participants have been able to be present in meetings and training. Obsolete software has not prevented the collaboration, but it has been found to be less effective than the newest software. This caused some frustration for the effective users of ICT.

It is important that all participants felt they had equal possibilities of participating in the entire process, including planning, action, and evaluation. Well-planned meetings have provided trust and feelings of effective collaboration. The participants have taken on shared responsibilities and participated actively. The actions of tutor-students have been found to be useful. The tutor-students have been able to learn a great deal of knowledge and skills, and moreover, they have been able to share their expertise. Tutor-students have been positively proud of their role in collaboration.

Discussion and Conclusions

The use of ICT to promote SCC was recognized as a means of support for students learning twenty-first century skills (Binkley et al., 2011), as has been seen in the results of this study. ICT was used in SCC in multiple ways where thinking, collaboration skills, and problem solving were needed. These skills were also needed in the planning of the ICT use in SCC. New ideas and innovations in using ICT in SCC were created. ICT tools were linked together in multiple ways. Students, for example, augmented an activity with storytelling, writing, and drawing based on stories. The drawings were imported into Notebook and finally, animations were recorded using the SMART Board. Those animations were presented at all collaborating organizations and other places, like learning exhibitions. Consequently, collaboration through the use of ICT is fruitful for CSS and learning to use ICT.

The results strengthen the idea of the importance of SCC. This collaboration creates versatile environments for learning. Moreover, the collaboration is an important way for an individual to combine, link together, as well as take advantage of data resources, expertise, and life experiences. The life-long learning and lifecycle approach was maintained as an integral component of this study. Tutor students visited the kindergarten, library, and seniors' home in multiple ways, especially to share ideas and expertise and give joy to partners and patrons. For tutor students, these visits were situations in which they could provide guidance, teaching, and presentation of their competences-especially while planning the visits. The shared responsibilities and activities, expertise, and life experiences are important elements that can be extended to society as a whole.

The use of ICT in SCC was redesigned and matched to fit the needs of each partner, according to different needs and constraints at the partner site. The introduction of the potential benefits and uses of the ICT tools was important from the point of view of supporting the generation of new ideas for the use of ICT tools in SCC. When participants became familiar with the basic use of an ICT tool, it became easier for them to match the use to fit the context of their own site and needs. For exam-

ple, in making animations, participants used ICT tools in a creative way to find new solutions by testing different kinds of tools and possibilities together. Tutor students also taught children in kindergarten, classmates at school, and patrons of the library to make postcards with the SMART Board, including pictures and texts. Those cards were printed and given to friends and relatives.

Through the actions of the organizations, tutor students acted as experts and gained experience on how to interact in public situations and to act as a teacher or presenter. According to student responses to the questionnaires and to interviews with them, they enjoyed acting as tutor students. They felt they learned many twenty-first century skills, like using ICT in different situations. They found significance in getting to know older people, and that even old people with memory disorders were kind and interested in collaborating with students and in seeing and using new ICT devices. Tutor students were proud to give happiness and joy to older people. The results were parallel to Epstein's (2011) theory for school collaboration programs. SCC has fostered learning of twenty-first century competencies, like critical thinking, collaboration, interaction, innovation, creativity, and ICT skills. Tutor students especially became familiar with the versatility of ICT tools. As a result, they have been able to redefine the use of those tools by generating new ways to employ them. In general, the tutor students were enthusiastic users of ICT and developed the use of ICT within their own organizations and shared their expertise with others. They surprised others with the games and animations they created. Afterwards, they claimed they felt incredibly happy and proud about their accomplishments. The tutor students voluntarily spent some of their school breaks practicing their ICT skills.

The experiences demonstrate that through establishing an ATP with representatives from organizations, it is possible for a school to collaborate and allow students to act as partners in society, giving them opportunities the school cannot provide itself. Shared actions integrate community members. It is important to pay attention to the active participation, accountability, and time resources to make the ATP work fruitful. Through good planning and intensive collaboration, it is possible to maintain a community where learning takes place regardless of time, place, or age.

Relying on Rogers' (2011) theory, the importance of participation and ability to modify the innovation for one's own needs makes the innovation sustainable over time. Moreover, Rogers' (2003) suggestions on the characteristics of innovation champions were confirmed in this study: the champions were of various ages, and they had various kinds of abilities and degrees of formal power. This was seen as important in this study. Students were capable of learning even better than adults because they were open-minded and had courage. They also had time to practice ICT tools during the school days and breaks and received more education than the busy adults.

The first cycle of the DBR project was initiated to determine how different devices were suitable for different purposes. SMART Boards were suitable for small children in kindergarten when installation considered placement and height. The small children accepted use of the interactive tools naturally, and they felt free to test the possibilities. Mobile devices seemed to be valuable in seniors' homes. In a way, ICT has been a tool to increase student visitation at seniors' homes and naturally sustains interaction with seniors.

The results show that it is possible to arrange new learning environments and cross boundaries through the active participation of various professions, patrons, students, and ages. By sharing ideas, planning, and implementing the ICT jointly, it is possible to provide positive feedback about participant and organization expectations and needs.

Schools must provide bridges between different kinds of learning environments and allow the crossing of boundaries to organizations located near the school in order to open possibilities to the outside world. Sharing experiences, research, and implementing outcomes in practice will foster collaboration. Teacher education should be involved in the development of collaboration possibilities and use of ICT as a tool in everyday activities and life-long learning. The roles of teachers at school should be reconsidered. Teachers have many responsibilities in student education and learning, considering the curriculum, and all other tasks. Resources are limited, and building up a well-functioning ATP is time consuming and demanding. One solution is to nominate a teacher at the school to be responsible for collaborating with organizations close to the school. This person could

also be the chair of the ATP. This teacher could arrange interaction and build bridges between various learning environments. The teacher should be released from the burden of having their own class. The teacher should also be educated in ICT use and in supporting the learning and professional development of other partners.

In the future, it would be interesting to further research how students learn collaboratively. Specifically, is it possible to learn important twenty-first century skills in collaboration? And, what is the significance to students of being members of the ATP? It is also important to research ways to share new ideas for teacher education to create collaboration and interaction by crossing boundaries and forming new environments for learning.

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4 Crossing Classroom Boundaries in Science Teaching and Learning Through the Use of Smartphones

Kati Sormunen, Jari Lavonen and Kalle Juuti

Abstract

The aim of this study was to better understand how smartphones can be applied as a means for personalized learning. Altogether, 49 fifth grade pupils and 3 teachers in an elementary school in the area of the capital of Finland participated in design-based research. Together the teachers, pupils, and researchers designed and implemented the use of smartphones in personalized science learning inside and outside school situations. After having time to become acquainted with the smartphones, the pupils used the phones during the water-themed science project. During the project, students were asked by web questionnaire what kind of applications and for what purposes they used the smartphones, while the teacher emphasized certain applications. Based on pupils' responses to questionnaires and teachers' logs, pupils used phones primarily for making notes, revisions, and information gathering. It seems that pupils need strong guidance in order to apply smartphones in learning.

Keywords: Personalized Learning, Science Learning, Inclusion, Mobile Learning

Introduction

Primary teachers face diverse challenges when organizing primary science activities according to the national-level curriculum and in heterogeneous classrooms in which several pupils with special needs are integrated into the class (Futurelab, 2003). Moreover, in this rapidly changing society, the technological environment and family life generate their own challenges to everyday classroom practices. Most teachers are willing to adopt new technology for use in their classrooms and respond well to the challenges (Lavonen, Juuti, Aksela, & Meisalo, 2006). However, it is not clear how technology should be used in a way that supports primary science learning amongst pupils with different needs (Warwick, Wilson, & Winterbottom, 2006). There is on-going educational policy discussion on twenty-first century competences among Organisation for Economic Co-operation and Development (OECD) countries, of which Finland is a member. Essential to this policy discussion is the question of future challenges. The twenty-first century competences emphasize novel ways of thinking and working and how engagement in thinking and working are supported. Moreover, it is essential to ask what the future context and tools needed for working will be (ITL-Research, 2011; James & Pollard, 2004; Lavonen, 2012). In order to prepare pupils for future challenges, the notion of personalized learning is often acknowledged in policy discussions.

This paper presents the results of a design based research (DBR) project conducted with smartphones in science classrooms. There was a special focus on personalized learning. First, we introduce the theoretical background for personalized mobile learning, and then describe the three cycles of the DBR and the data collection techniques in the method section. The results section describes the outcomes of the study and explains how pupils use smartphones in personalized science learning. A discussion and conclusion are provided in the final section of the paper.

Theoretical Background

Personalized Learning

The term *personalized learning* has been defined in different ways. Primarily, the term is used in studies that deal with software design in computer science (e.g., Samson & Karangiannidis, 2002). However, we understand personalized learning in a broader way. In this study, we are interested in the use of technology as a means for personalizing learning for pupils inside and outside school. For us, personalized learning is a process in which pupils are exposed to high-quality teaching and learning, and their abilities and working and learning skills are further developed by offering variation in the selection of content, the learning process, and concrete outcomes of the process. Personalized learning is a reaction to the fact that pupils come to school with different knowledge and skill bases, as well as varying learning preferences, interests, and aptitudes (Heller, Mayer, Hockemeyer, & Albert, 2005). Therefore, each pupil must be taken into account and schools need to create equal learning opportunities for everyone tailored to their individual knowledge, skills, and needs (Järvelä, 2006).

The origin of personalized learning is political. In practice, the Finnish National Core Curriculum for Basic Education 2004 (FNCCBE) is the political document that schools should follow. The FNCCBE (2004, pp. 16–18) provides teachers with a guide for organizing personalized learning in a classroom. Figure 1 summarizes how the FNCCBE defines personalized learning at the pupil, home-school collaboration, and classroom levels.

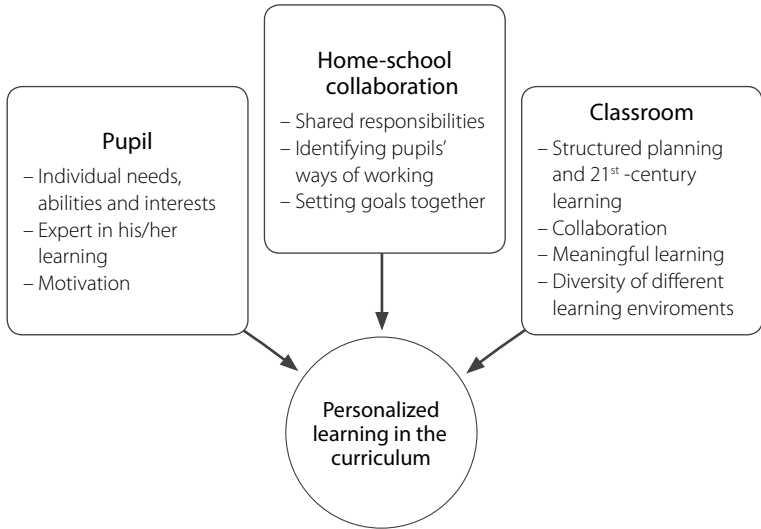


Figure 1. Personalized learning in the Finnish National Core Curriculum for Basic Education 2004 (pp. 16–18).

The term *inclusion* is part of the notion of personalized learning. In the inclusive education pupils identified with special educational needs are learning in mainstream classes. Their diversity of interests, abilities and attainments are noticed (Hick, Kershner & Farrell 2009). The idea of inclusion is present in Miliband’s (2006) definition of personalized learning, which has five components:

- Learning should be based on personal knowledge of each pupil’s strengths and weaknesses;
- Students should learn a variety of learning strategies, from which they can pick their own characteristic way of learning;
- Students should be able to choose their own breadth of study and their own learning paths;
- Class work should support those individual learning paths; and
- The school’s immediate environment and the wider community should support personalized learning.

Differentiation is a key issue in planning personalized learning. Fullan (2009) noted that in the United States, *differentiated instruction* is a more

common term to describe a concept similar to personalized learning. At the practical level, teachers can engage in differentiation in terms of the content, process, or product. *Content* is what the teacher wants pupils to learn and the materials or mechanisms through which this is accomplished. *Process* describes activities designed to ensure that students use key skills to make sense out of essential ideas and information. *Products* are vehicles through which pupils demonstrate and extend what they have learned (Tomlinson, 1999).

Mobile Learning Expands Learning Environments

The aims for the use of information and communication technology (ICT) in education are also written in the FNCCBE. Basic education has to offer a fundamental knowledge of technology. Instruction must advance understanding of the operating principles of tools, equipment, and machines, and teach the pupils how to use them (The FNCCBE, 2004, pp. 36–41). As personalized learning is learning for today's concept (Miliband, 2006), mobile learning and mobile tools, like smartphones, provide pupils an opportunity to work wherever and whenever they need to (Kotilainen, 2011).

Sharples, Taylor, and Vavoula (2005) stated that the basic assumption related to mobile learning is that learners are continually on the move. Students learn across space, taking ideas and learning resources gained in one location and applying or developing them in another. Effective mobile learning involves learning knowledge, the assessment of the learning process and outcomes, and collaboration.

Sharples et al. (2005) concluded that a social-constructivist approach is best suited for mobile learning, as it emphasizes learning as an active process of building knowledge and skills through practice within a supportive community. Hakkarainen (2009) introduced collaborative knowledge building as an object-oriented process, where the objects being developed can be problems and theories, ideas and concepts, prototypes and materially embodied artefacts, or projects or practices being subjected to development and transformation. Knowledge-building competences are needed in a knowledge-creation society. The learning described above

is also emphasized in the FNCCBE: learning is both an individual and a collaborative process in which a pupil builds knowledge and skills.

In this study, we are interested in how the smartphone as an ICT tool works as a means of personalized learning. The smartphones are used to support individual learning and for the collection and analysis of information. Pupils have their own smartphones and are familiar with using them. They have the same skills for handling these devices as many adults. They are also eager to use them and learn more about them. Research on learning and motivation shows that the use of ICT tools in science education could support meaningful learning and student motivation (Hakkarainen, 2009; Lavonen, Krzywacki, Koistinen, Welzel-Breuer, & Erb, 2012; Osborne & Hennessy, 2003).

Research Questions

In this paper, we aim to answer the following two questions:

- How do pupils use smartphones in personalized learning while engaged in a science project?
- How does the teacher's guidance during the science project influence the frequency of smartphone use?

We will answer these research questions by analyzing daily reports from the pupils about their smartphone use and the teacher-researcher's field notes.

Method

The study was conducted according to the principles of DBR (Sandoval, 2013). In order to acquire novel educational knowledge concerning smartphone use by pupils in personalized learning, a science project was designed to include several ways to apply smartphones.

The DBR had four phases (Figure 2). In the first phase, all the practitioners familiarized themselves with the devices. Data about actions in that phase were collected through the teacher-researcher's field notes. In the second phase, practitioners planned the process with a view to generating models for smartphone use in science learning.

In the third phase, the developed models were tested in action. The uses of the smartphone were determined using a questionnaire filled out by the students every evening after school for a three week period. The questionnaires were administered through the smartphones (using the Socrative application). The questionnaire had both yes/no and open-ended questions. The teacher-researcher also wrote field notes during the testing period.

The fourth phase, which was only completed by the researchers, involved reflections on the actions of the first three phases. In this final phase, the uses of the developed models were also assessed. The answers to the questionnaires were analyzed through statistical methods (frequencies and correlations). Open-ended answers were analyzed through content analysis. The results were compared and reflected upon in the field notes.

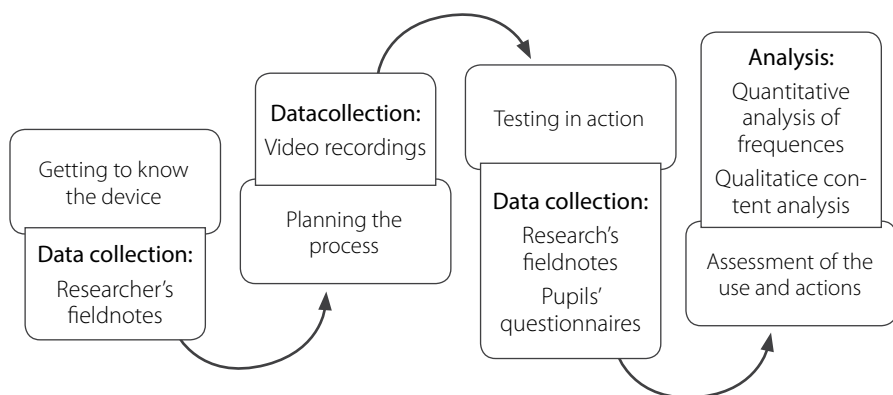


Figure 2. The phases of design-based research.

Context of the Study

This section briefly describes the first and second phases of the DBR project in order to illustrate how students familiarized themselves with the smartphones before phase three: the science project. Altogether, 49 pupils (54% male, all age 11) and three teachers (the teacher-researcher and two classroom teachers) were active practitioners in the study. One of the teachers is the first author of this paper.

Phase One: Getting to Know the Devices

At the beginning of the cycle (the end of August 2012), the pupils received smartphones (Nokia Lumia 800). Each smartphone had a data package on it allowing the use of the Internet, but the ability to make or receive calls with the phones was not activated. This reduced the expense. During the

Table 1. Familiarizing Students with the Smartphones, Their Applications, and the Use of Applications in Learning

Personalizing the Device	Using Applications	Phone as a Learning Tool	Support for Pupils/Parents
<ul style="list-style-type: none"> - Getting started - Creating a Windows Live ID - Setting a picture as wallpaper - Setting the style and ringtone - Pinning websites to the start menu - Syncing pictures and videos to SkyDrive 	<ul style="list-style-type: none"> - Taking pictures and videos - Making calendar marks and notifications - Adding contacts - Windows Live settings and functions - Sports Tracker - Multiplication app - Sending emails and SMS 	<ul style="list-style-type: none"> - Searching information (arts) - Practicing English vocabulary with OneNote - Making short films with phones - Writing down logging information for OneNote - Making an English word test with Socrative or SMS - Completing homework and sending it to the teacher - Submitting work with Socrative 	<ul style="list-style-type: none"> - Parental meeting to introduce the phones - Setting up an Xbox account and using Marketplace - Creation of a video tutorial on how to create the Xbox account - Making and accepting friend requests in Messenger

first month, the pupils learned to use the smartphones together and actively shared their experiences (Table 1). The smartphones had been set up before being given to the pupils and the pupils played with and examined the devices as they desired. The practitioners shared ideas and the teachers used these in several learning situations. A meeting was also organized with the parents to discuss the use of the smartphones. The teacher-researcher also created a video tutorial that showed how to create an account.

Phase Two: The Brainstorming and Planning Processes

During the second phase (Figure 2), together the teachers designed the basic structure of the water project and generated preliminary models for active smartphone use in science learning. The pupils were included in the planning process, especially for the planning of models for smartphone use. It was decided that an idea generation session with pupils would be organized in order to get novel ideas on smartphone use in project type learning. The teachers took into account the characteristics of the personalization of learning in the form of the content and in the learning process in their planning. In this personalization, the individual needs, abilities, and former learning experiences of each pupil were taken into consideration. The teachers decided to use varied methods in their lessons, like group work and guided inquiry, and focused on the differentiation process.

After the teachers' planning and pupil idea generation session, the pupils were introduced to the water project and working methods, including an orientation to the inquiry process and the use of smartphones during the project. After this introduction, pupils were divided into 12 groups, with four pupils in each, including both girls and boys. Groups were given the task of generating ideas for the versatile use of smartphones during the project. One group member was designated as the group leader; this individual was given quick training on idea generation techniques and how to support all pupils during the idea generation session. Support for all group members and the minimization of critical evaluations during the idea generation sessions were especially emphasized. Group leaders were chosen according to their ability to take video recordings with an iPad. Leaders had a note sheet with them to support note taking during idea generation.

Group sessions were recorded using an iPad and the ideas from the groups were collected during a session with the whole class (Table 2); the ideas were then printed on posters that were put up on the classroom walls. Then the pupils were given the opportunity to establish aims and special working methods as well as to decide on the physical space for learning.

During the pupils’ idea generation, the planning, and the testing phases, the pupils were divided into three groups of 16 pupils each. Each group worked with one teacher for one week (two teachers with three lessons administered by each). The science project topic was water and its properties (states of water, surface tension, buoyancy, capillarity, dissolution, and solution) and the pollution and purification of water. Teachers guided pupils in inquiry activities in which they used smartphones. The pupils looked up information from various sources and made reports, which they emailed to the teachers at the end of the project. In the reporting phase, the pupils used different tools like cameras, voice recorders, and notepads.

Table 2. Classification of Pupils’ Ideas for Smartphone Use in Personalized Science Learning Formulated in the Idea Generation Sessions

Content Spaces	Tools Supporting the Learning Process	Cooperation Tools	Tool Applications
<ul style="list-style-type: none"> - Search engines Google and Bing -> Picture search -> Video search - Wikipedia - YouTube - <i>Helsingin Sanomat</i> (newspaper) 	<ul style="list-style-type: none"> - Taking pictures - Making podcasts - Writing - Taking videos - Making lists - Listening to podcasts 	<ul style="list-style-type: none"> - SkyDrive - Messenger - Vimeo - Skype - Email 	<ul style="list-style-type: none"> - Office programs - Sääkaveri (weather app) - Map software/navigator - Calculator - Water level app - <i>Helsingin sanomat</i> app - Vimeo - Skype

The generated ideas were analyzed and evaluated together, first with teachers and then with pupils. Teachers supported the implementation of the ideas in the classroom situation. In order to support personalized learn-

ing, the teachers, along with the pupils, decided to emphasize the making of notes (process) and searching for information (content) using the Internet. In particular, the use of different tools in their learning process, such as voice recorders, video recorders, notepads, and calendars, personalized the note making and allowed appropriate tools to be employed, especially in the case of pupils with special needs. Moreover, teachers also decided to share information through email (cooperation). Other ideas could be freely implemented for learning.

Data Gathering

The research data—pupil self-evaluation of smartphone use in learning—was collected through smartphone questionnaires at the end of each school day during the three-week period of the water project. The questionnaire was designed and administered using Socrative (a free web-based student-response system). Socrative was familiar to the pupils. They had used it, for example, on English word tests and peer reviews. The week before data collection, we pinned the Socrative website to each phone's start screen. We also created calendar notifications about the questionnaire.

The questionnaire contained yes/no questions that aimed to clarify the use of smartphone tools and collaboration between pupils and teachers. After each question, there was an open-ended question. The response rate during the first week was 77.5%, the second week it was 60.4%, and the third week it was 53.0%. The data were analyzed using quantitative methods. During the first four days, the teacher-researcher made sure that everyone answered the questionnaire, and calendar alarms were created to accomplish this. If a pupil did not respond, the pupil completed it the next day at school. During the second and third weeks, the teacher only reminded pupils to answer and sent emails home, asking parents to remind the pupils as well. This is why the response rate declined over the course of the project. However, this did not affect the reliability of the study, because we were interested in how pupils adapted the smartphones to their learning.

During the DBR, the teacher-researcher kept a field notebook. This included descriptions of how the teacher had guided the pupils' use of the smartphones, how the pupils used the phones, and what successes and difficulties were evident. The notes were compared to the results of the questionnaire. If there were differences between the questionnaire data and field-notes, students were asked to resubmit their answers or notes were clarified. For example, on the tenth day of the project, only one pupil responded through the questionnaire that he had been in contact with a teacher. The field notes indicated that thirteen pupils sent emails to the teacher. This was reported to the pupils and they were asked to answer the questionnaire more carefully. Therefore, it was important that the teacher-researcher kept the field notebook, because the notes supported the interpretation of the questionnaire data and strengthened the reliability of the analysis.

Results

Table 3 shows the frequencies of pupils' self-evaluations of the smartphone use in science learning. We grouped the data into three main categories based on the review on personalization (content, process, and cooperation). Subcategories were also formed, specifically process (making notes, exercises, and using the calendar) and cooperation (help from home, contact with friends, and contact with the teacher). In the table, categories are given in the top row, and under each of these the pupils' daily usage is shown. Underlined numbers show that the teachers supported pupils in applying smartphones in their science learning project in a personalized way. The science project days are marked with an asterisk. The last row of the table shows the total usage during the project.

Table 3. Smartphone Use in the Science Project (All Respondents)

Day	Content	Process			Cooperation		
	Searching information	Making notes	Exercises	Using the calendar	Help from home	Contacting friends	Contacting the teacher
1	<u>28</u>	<u>12</u>	17	<u>18</u>	<u>17</u>	7	4
2	10	5	<u>7</u>	12	16	4	2
3*	<u>19</u>	<u>41</u>	<u>31</u>	5	13	7	7
4	9	12	14	9	4	4	1
5*	<u>6</u>	<u>13</u>	<u>15</u>	4	3	2	5
6	14	13	<u>13</u>	4	14	6	4
7	8	<u>21</u>	<u>12</u>	3	8	6	2
8*	<u>17</u>	<u>26</u>	<u>14</u>	3	13	6	12
9	8	8	12	4	9	4	2
10*	8	<u>24</u>	<u>11</u>	4	4	6	13
11	3	4	<u>13</u>	3	11	3	<u>9</u>
12	11	4	<u>15</u>	3	15	3	<u>9</u>
13*	<u>12</u>	<u>25</u>	<u>12</u>	3	8	4	11
14	3	3	9	2	9	4	3
15*	<u>6</u>	<u>20</u>	<u>14</u>	2	3	4	15
SUM	162	231	209	79	147	70	99

Note. Science project days are marked with asterisks. Underlining shows tools emphasized in teaching.

Pupils primarily used smartphones in their working processes. They made notes with different applications (Office, OneNote). Pupils were guided to make notes in diverse ways, including through writing, voice recordings, pictures, and videos. They also had homework on project days in which they were asked to review learned topics by reading their notes (exercises). Playing educational games and watching educational videos were also included

in the exercises. Pupils used the calendar during the first two days. On the first day, they made calendar entries at school with the teachers. Pupils also used smartphones for information gathering. The methods that pupils employed for using smartphones were similar to the teachers' aims for the use of smartphones during the water project. In accordance with these aims, teachers also guided pupils to use OneNote and Office for note taking and to employ the smartphones to search for information.

Pupils exhibited different kinds of cooperation during the water project. Primarily, they received help from home. Help generally involved reminders to answer the data-gathering questionnaires. Contact with friends or the teacher was minimal, even though pupils were expected to contact the teacher.

Pupils reported an increase in the use of smartphones when the teacher asked them to apply smartphones in their learning activities rather than in situations where the students were able to work according to their free choices (marked with an asterisk in Table 3). The use of smartphones for making notes and completing exercises seemed to be connected to the teacher's actions, such as the recommendation to use the phone tool. Pupils searched for information fairly consistently during the project, but searches increased when such information gathering was included as part of the learning activity. Help from home was stable during the cycle, as was contacting friends. Pupils used the calendar most on the first day when they marked it as a class. Contact with teachers increased towards the end of the project. In the second and third weeks, contact with the teacher increased both through email and text messages.

Discussion and Conclusions

In this research, we dealt with a device that is relatively unfamiliar to adults and teachers. However, the device had great potential to elicit learning, especially from those who have special needs, such as dyslexic students. The main result of this research was the insight that pupils do not spontaneously use smartphones in learning. Therefore, they need continuous guidance, at least at the beginning of the project, related to how to apply smartphones in learning. Further, teachers require pedagogical support when it comes to the use of smartphones. This must be taken into consideration in the teachers' pre- and in-service education, as well as in the implementation of education policy.

At present, teachers are educating children who are used to interacting with digital technology. These "diginatives" have diverse skills in using contemporary ICT tools. During this project, several pupils had their own smartphones, allowing them to access information and support quickly. Unfortunately, these devices were used almost entirely for entertainment purposes. Such issues bring challenges for educators. There has been a vivid discussion in the leading Finnish newspaper, *Helsingin Sanomat*, concerning smartphone use at school. The common opinion seems to be that smartphones disturb learning at school (Juntunen, 2013).

Personalized learning is a process that aims to support effective learning in which pupils' abilities, work habits, and strategies are developed. It is important to create concrete models that clarify how to personalize learning in practice in the way that Järvelä (2006) and Miliband (2006) described and in line with what the FNCCBE expects. Figure 3 introduces an approach to personalizing learning with smartphones. Based on the results of this research, the adaptation of smartphones as a tool for personalized learning is a long process that requires teachers to engage in a great deal of structured planning, followed by the introduction of the use of smartphones to pupils along with continuous guidance. The guiding teacher must also offer divertive learning materials for different learning strategies.

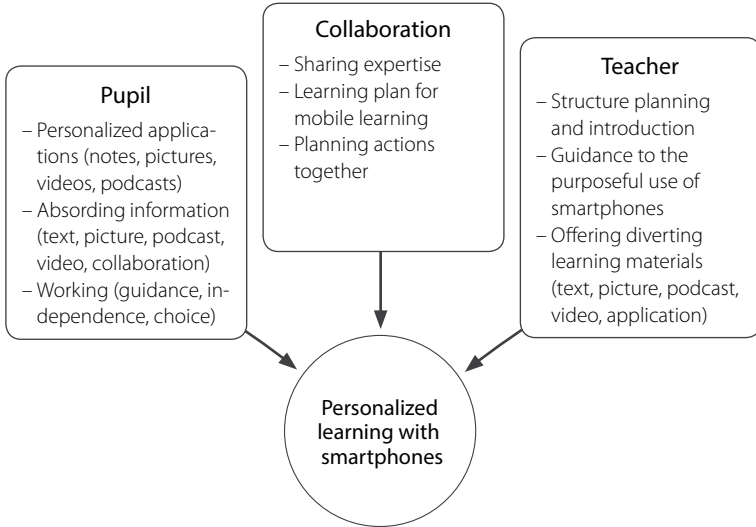


Figure 3. Model of the use of smartphones in personalized learning.

This study emphasized the importance of working with the device collaboratively in the initial stage. Co-planning and empowering pupils to engage in activities in which the approaches to smartphone use are generated will support pupil ownership of smartphone use. Pupils are motivated to explore the possibilities of the device, and the teacher has the pedagogical expertise to use those ideas in learning situations. At the same time, pupils reflect on their learning strategies and find tools that both support and help them plan the next steps in their learning. This process is important when we want to personalize learning, as Miliband (2006) described. These metacognitive skills need time to develop and the teacher must offer situations that allow student self-reflection.

The study shows that the types of smartphone use that have been carried out regularly in real educational situations mirror everyday use. For example, information searches and the use of OneNote to make notes and do exercises were exhibited regularly in every phase of the study (see Tables 1, 2, and 3). It was difficult to convince students to employ tools not typically used in making notes, such as the voice recorder, video recorder, and

calendar, even though these functionalities could personalize student note taking. Therefore, the teacher from time to time must review the various mobile learning tools that can be used so that the pupils' employment of mobile devices in their learning becomes more versatile. Teachers also need to create ways to support pupils and parents, both in terms of learning and problems they experience with the device itself. In this study, a parent meeting was organized and tutorial videos were shared.

During this process, teachers and researchers produced a learning plan that included mobile learning. The process of initiating the use of smartphones in personalized learning is still on-going. The second iteration cycle of the DBR with the same pupils was performed in spring 2013, when the phones were used in collaborative settings and data on this use were collected. In fall 2013, smartphone tools were used in diverse ways in the learning.

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Part II

New Tools for Teaching and Learning

5 Teachers' Capacity to Change and ICT Environment: Insights from the ATEPIE Project

Jelena Radišić and Jasminka Marković

Abstract

Teacher capacity to cope with and take change forward is increasingly recognized as an essential part of the roles and competences of teachers. The agenda to increase school inclusiveness and responsiveness to the rising diversity of students and the change in learning environments implies that, in addition to utilizing scientifically grounded pedagogies, teachers must also address changing conditions that affect their teaching. One promising possibility for making teaching and learning environments more supportive is to enrich learning situations with technology, thus creating collaborative spaces for learning, sharing, and expanding our perceptions on how learning occurs. The objective of this paper is to describe how teachers participating in the project Advancing Teacher Professionalism for Inclusive, Quality and Relevant Education (ATEPIE) perceive themselves and manifest skills in their practices, particularly with regard to ICT. Through five focus groups organized in Bosnia and Herzegovina, Croatia, Montenegro, Macedonia, and Serbia we explored teachers' perceptions of their practices as change agents. Furthermore, all participants completed a questionnaire to provide more data on their use of information technology in their everyday lives, their perceptions about using ICT in teaching, and their perceptions about their own competence in using ICT. Among

the perceived traits, teachers acting as agents of change have indicated the necessity to have expertise, creativeness, and innovativeness. Teachers believe that a readiness to learn and skills in finding information are among the most important competences teachers must hold. Although teachers generally feel confident using technologies, they rarely bring it to their teaching practice.

Keywords: Teacher Competence, Teachers' Perceptions, ICT

Introduction

As a part of their overall political and economic transition, the countries of South East Europe (SEE) have become involved in the comprehensive reform of their education systems. The main feature of the reforms in the SEE region is moving from the “system level,” downwards. Legislation and strategies are prepared, and new curricula for pre-school, primary, and secondary education are being developed and adopted, all with an aim to provide quality, equitable, and inclusive education for every child, according to their potential. Thus, the focus of the reform is gradually shifting to what actually happens within schools, or more specifically, within classrooms, between the pupils and their teacher. This means that schools and teachers become paramount in ensuring that actual change of practice occurs, making it truly inclusive in an attempt to respond to the diverse needs of students.

Given the economic situation of SEE countries, global economic trends, and intense competition for public funds between education and other public sectors, it is highly unlikely that the pressure to reform the education system will be supported by any significant increase in resources allocated to the education sector. This means that the schools are expected to and must be capable of changing and adapting to the new challenges they face. To effectively create responsive schools, schools themselves must rely on competent teachers and have open, democratic, participative governance with active parental and local community involvement. However, reforms

in all SEE countries appear to assume that teachers are adequately motivated and skilled to respond to the needs of the community and individual children. Teachers should be able to adopt new teaching and learning approaches for children with diverse educational needs and from various socio-economic backgrounds.

Long ago Fullan (1993a) has emphasized how schools are expected to participate in a continuous “renewal”, with expectations to change being put at the fore. Yet, the way the educational hierarchy is structured and decision are made, along with the way teachers are initially prepared for the teaching profession and schools are lead, rather results in a system in which the status quo is retained. The remedy is seen in making explicit the goals and skills of change agency. In order to be effective, a teacher must become a career-long learner of more sophisticated pedagogies and technologies. He/she has to be able to perform and obtain productive collaborations with colleagues, parents, and other important stakeholders. Any systemic reform which profoundly does not tackle the teachers, will not lead to any kind of a profound change (Sarason, 1996). Thus, teacher competencies and agency to change have become the focal points of the discourse that describes teachers' roles and everyday practice. Teacher competences are understood as an integrated combination of personality traits, knowledge, skills, and attitudes, all of which are required for the efficient management of various teaching and learning situations (Tigelaar, Dolmans, Wolhagen, & van der Vleuten, 2004, p. 255).

Agency is perceived as the process through which teachers develop a vision of improved practice, act strategically to evaluate and improve their own actions, and mutually share responsibility for change and outcomes of all students (Frost, 2012). Although there is a longstanding assumption that teachers can generate social and educational change (Freire, 1970; Fullan, 1993a, 1993b), evidence about the capacity of teachers to cope with and lead change and how this manifests in their own practice is scarce. Nieto (2007) acknowledges several roles teacher as agents of change embody in their classroom: 1) believing in, and advocating for, public education; 2) challenging conventional wisdom; 3) improvising; 4) modelling social justice, and 5) using their power inside and outside of the classroom (p. 303). The author further emphasizes that the most successful teacher

leaders are skilled in their pedagogy, well versed in their subject matter, and consciously political in the sense that they know their work makes a difference. They exemplify particular behaviors and attitudes that help them teach their students, while at the same time challenging inequities both in their schools and more broadly, in their communities and beyond.

In the above described process of reforms, teachers are also expected to be capable and willing to actively participate in the development of new curricula, new policy documents, teaching approaches, and teaching aids, and to be in charge of their own professional development. With this in mind, information and communication technology (ICT) is seen as an instrument and opportunity to provide a variety of tools that can open up new possibilities in the classroom. As stated in the report, *Key Data on Learning and Innovation through ICT at School in Europe* (EA-CEA/Eurydice, 2011, p.3) ICT can specifically help tailor the educational process to an individual student's needs. ICT can also provide learners with the crucial digital competences needed in today's knowledge-based economy. Furthermore, Condie and Munro (2007) argue that computers in the classroom can be particularly useful in personalizing teaching and learning, regardless of the particular aim (e.g. to respond to special needs, individual interests, or to implement individualized learning programs). Finally, in the policy brief on *ICT for Learning, Innovation and Creativity in Europe* delivered by the Institute for Prospective Technological Studies (Ala-Mutka, Punie, & Redecker, 2008), the benefits of using ICT in teaching and learning are discussed. Notwithstanding ICT potential to advance the effectiveness of learning and learning outcomes, methods used in doing so are of crucial importance.

Although many authors agree that ICT provides a number of ways to improve teaching and learning, their integration into existing educational programs is seen as a complex process involving many different factors (Balanskat, Blamire, & Kefala, 2006). Though the barriers hindering effective integration of ICT tools in education may be classified in various ways (Mumtaz, 2000; Pelgrum, 2008; Bingimlas, 2009), two main sets of obstacles are usually singled out—those relating to teacher behavior, beliefs, and knowledge, and those related to school-level barriers (e.g.,

insufficient technological infrastructure, software, Internet connectivity, and technical support).

As noted by Law, Pelgrum, and Plomp (2008), ICT in the classroom has an effect on the pedagogical methods employed by teachers. Yet, those teachers using ICT must possess adequate knowledge to fully utilize it in their own classrooms. Also, ICT must be used in a purposive way that allows teaching and learning environments to become more supportive, thus creating collaborative spaces in which both teaching and learning may occur. Finally, teachers need to see the value of enriching learning situations with technology. Therefore, in addition to having specially trained ICT teachers, it is important that all subject and general teachers have the knowledge and skills to enable them to integrate ICT into their daily teaching routines. Initial teacher education should provide teachers with knowledge of new and innovative approaches, but continuous professional development, i.e., in-service education, should also do so equally. Only this will provide teachers with the confidence to try using digital technologies and reflect on the impact these may have on their teaching practices.

Korte and Hüsing (2007) argue that although a positive trend is observed in teacher use of computers in the class, general motivation to use ICT is often questioned. As technologies are continuously changing, teachers need regular support to keep up with the latest developments and the necessity of continuous professional support in that domain as well. To achieve this, access to minimally satisfactory ICT infrastructure is still one of the most important precursors contributing to the efficient use of digital technologies in schools. Some research (Pelgrum, 2001; Korte & Hüsing 2007) shows that over the past decade, a lack of technical support is still perceived by teachers as one of the main barriers to the introduction of ICT resources in their daily routines.

In almost all European countries, a specific (often national) strategy related to digital competence and usage of ICT in schools has been adopted (European Commission/EACEA/Eurydice, 2012). The tactics vary from wide-reaching strategies that encompass several areas, to ones with a focus specifically on ICT in education. Despite the developed strategies, data show that primary and secondary school teachers of approximately half the student population across the European Union do not use computers

in mathematics or science lessons, even when computer availability is not an issue (EACEA/Eurydice, 2011). Data collected within the European Survey on Languages Competences (2012) suggest that ICT is regularly used during language lessons for less than 20% of the student body in Europe (EACEA/Eurydice, 2012).

Western Balkans countries recognize the use and value of ICT in education. However it is difficult to find systemic data on how ICT is used in schools across the region. Despite the fact that all Western Balkans countries are aligning their strategic education documents with those developed within the EU (i.e., competence based education), not all countries are developing at the same pace. For example, while digital competence is part of the Croatian curriculum framework (Ministry of Science, Education and Sport, 2011), in Serbia, development of e-education is part of the National Strategy for an Information Society in Serbia (Official Gazette of Republic of Serbia, No. 40/2010), while the national curriculum framework is yet to be designed. However, despite the above mentioned differences, development of ICT in education is observed through the requirement of learning and professional development for both students and teachers and the necessity of establishing a broad ICT structure.

In cooperation with the Education Support Program of Open Society Foundations (ESP/OSF), the Centre for Education Policy in Serbia with partner organizations in Western Balkans countries implemented the Advancing Teacher Professionalism for Inclusive, Quality and Relevant Education (ATEPIE) project. The main project output is the Regional Teachers' Competences Framework, which can serve as a guideline for upcoming changes to educational practices and the reform of the educational system. Within the scope of the project activities the learning environment, with a focus on information literacy, is defined as one of the six most important areas of the competences for the teaching profession. In addition to developing the regional teachers' competences frameworks, the project has also strived to empower teachers from *Bosnia and Herzegovina*,

Croatia, Macedonia, Montenegro, and Serbia who are involved in a related project, International Teacher Leadership.¹

The objective of this paper is to describe how teachers who participated in the Advancing Teacher Professionalism for Inclusive, Quality and Relevant Education (ATEPIE) project perceive themselves and manifest skills in their practices. In particular, which competences teachers perceive as most important and necessary in their everyday classroom routines, keeping in mind the demands of the current reforms in the SEE region? And, with respect to the use of ICT in schools, what are the current practices of teachers in the teaching and learning process and to what extent teachers perceive ICT as a tool for enriching the learning environment?

Methodology

Sample

The data were gathered in September and October 2012 through 5 focus groups with 52 teachers participating in the ITL program in the Western Balkans. One focus group from each of the following five countries was formed: Serbia, Macedonia, Croatia, Bosnia and Herzegovina, and Mon-

1. International Teacher Leadership project (ITL) was initiated by David Frost at the University of Cambridge Faculty of Education in 2008 in response to interest shown by researchers and practitioners in countries such as Croatia, Greece, Portugal, Romania, Spain and Turkey in the work on teacher leadership within LfL and the HertsCam programme. The purpose of the ITL project is to develop programmes of support for teacher leadership in a number of countries and then explore how this can contribute to educational reform. These programmes take the form of support groups within schools or clusters of schools and some kind of local knowledge network within which teachers can inspire each other by sharing accounts of their initiatives. The project is conceived as a collaboration with partners – researchers, practitioners and other activists in 15 national sites: Albania, Bosnia & Herzegovina, Bulgaria, Greece, Croatia, Kosovo (as defined by UNSCR 1244), FYR Macedonia, Moldova, Montenegro, New Zealand, Portugal, Romania, Serbia, Turkey, UK (Sth East) and UK (Cambridge). More about International Teacher Leadership may be found at <http://www.educ.cam.ac.uk/centres/lfl/researchanddevelopment/teachers/itl/> and <http://www.nastavnickovodstvo.net/>

tenegro. Each focus group included teachers working in lower and upper elementary schools (ISCED 1 and 2). When choosing ISCED 2 teachers, subject matter diversity was taken into consideration (e.g., language and math, foreign languages, social and natural sciences). Years of experience and status as full or part time teachers was also considered. However, we paid particular attention to whether a teacher had participated in the ITL program. Out of all teachers who participated from all five focus groups (52 teachers), 46 participants were female and 6 male. Further, 7% of teachers were younger than 30 years of age; 32% belonged to the 30–40 age group, 43% were in the 40–50 age group, and 18% were older than 50 years of age. Regarding their work experience, 8% of teachers had up to 5 years of teaching experience, 27% had 6–10 years, 44% had 11–20 years, and 22% had over 20 years of teaching experience.

Instruments

For the purpose of this study, two techniques were used to gather data: focus group interviews and a questionnaire. A focus group guide comprised of several subtopics was developed. The topics were: a) necessary traits for teachers, considering teachers' roles today; b) professional competences, knowledge, and skills that teachers should possess; and c) values teachers should strive for in their everyday practices. The focus group guide was provided in the local languages. Each focus group session lasted between 90 and 120 minutes. The focus group discussions were recorded and transcribed.

Following the focus groups sessions, each teacher completed a questionnaire comprised of items related to the use of ICT in everyday life (e.g., use of various websites and social networks, following news services online). Teachers' attitudes related to usage of ICT in teaching (e.g., ICT can enhance teaching and the learning process; ICT can foster cooperation between students; ICT fosters student participation in class); and perception of their own competences when using ICT in everyday practice (e.g., I successfully use text processor applications; I use ICT in teaching to provide feedback to my students). The participants were not aware of the content and the purpose of the questionnaire prior to its administration.

Analysis

Analysis of the data obtained through the focus groups was completed giving consideration to specific subtopics. Teacher perceptions were analyzed relative to current views related to teacher competences. Data were coded and analyzed using the constant comparison method (Merriam, 1998). Originally the method itself was developed as a means of developing grounded theory, which again consists of categories, properties, and hypothesis representing conceptual links between the categories and properties. The basic strategy of the method is to constantly compare participant responses. Due to these basic principles of analysis the method is widely used even outside the grounded theory approach. Participant responses were compared to all of the transcripts relating to a specific topic in order to formulate preliminary categories and subcategories, which were then applied to all data. Results are presented primarily by listing different elements that appear in participant responses. Some individual respondents are quoted. The quotes selected reflect opinions of most teachers who participated in the study.

SPSS 20 was used for the descriptive and correlational analysis of questionnaire data.

Results

Four major topics emerged from the teacher narratives. They relate to: 1) desirable teacher traits, 2) values important in the teaching profession, 3) description of everyday practices, and 4) obstacles teachers encounter in their everyday practice. Finally, teachers discussed what it meant for them to be agents of change and the skills needed to act as an agent of change.

In their attempt to describe desirable features that a teacher should possess, especially in light of the demands put on the teaching profession today, the focus group participants described expertise, creativity and innovativeness as three key elements every teacher should possess. As teachers are expected to become principal agents that ensure actual change of practice, they also need to be cooperative, tolerant, flexible, and com-

municative when interacting with others. However, they all agreed that a teacher, as a change agent, must be ready to “pull up one’s sleeve” in order to foster the necessary change.

“For me a teacher leader is someone who is willing to take risks, someone who is innovative and has vision.” (primary school teacher, Macedonia)

In line with that, we observed among the teachers participating in the study that readiness to learn, being aware of the influence that the teacher profession has on the broader public, and the level of self-confidence that allows one to put things in motion and motivate others are important pillars of the profession today. Our participants recognize that these are essential values that a teacher should strive for, along without forgetting that the children are those who matter the most. Teachers also emphasized how fulfilling this mandate is only possible for those teachers who believe in a culture of collaboration between colleagues, who are ready to act as a role model, and who are even ready to “fight the windmills” if necessary.

Consequently, today a teacher is not really a teacher if their practice is simply to wait for the 45 minutes of class time to pass (the duration of a lesson in the Balkan countries) and then go home. A teacher is expected to organize, participate, motivate, and put people and actions into motion around them. Especially while working with pupils, teachers are obliged to employ various teaching methods, adapting them to the needs of the individual child. Teachers must improvise in a meaningful way:

“The teacher - leader has to have broad cultural knowledge and seek new information about the conditions in the school, municipality and society permanently.” (primary school teacher, Croatia)

“I think that the initial professional knowledge is one of the crucial prerequisites but it is not always enough. The constant professional development is fundamental to keep us teachers “alive” and aware of the development of our profession in the contemporary societies.” (primary school teacher, Serbia)

Teachers also recognize that their everyday routines cannot take place without teamwork and encouragement given and received from others. In that sense, sharing ideas among colleagues is emphasized as an important aspect of a day-to-day practice. However, what is noticeable in the teachers' narratives is that when teachers do talk about their practice, it is described at the individual level, in the context of a school that the particular teacher works in. Therefore, collaboration between the teachers takes place within their own work place and if one steps out of the school walls for collaboration to take place, it is with the local entrepreneur or a parent, but not a fellow teacher from another school.

It is important to determine what hinders the everyday routine in a teacher's attempts to make a difference. First, teachers themselves admit that it is simply very difficult to start something new, that they lack the courage to try out new things and attempt to change well-established practices. Notably, an obstacle that comes hand-in-hand with the desire to change is evident in comments about attempts of fellow colleagues to underrate any action that may lead to change. Participants referred to these colleagues as "brakemen." Teachers participating in the focus groups further explained how these colleagues are simply unaware of the deep impact the teaching profession has on the lives of not just their students, but of the wider community as well. Further obstacles are seen in purely administrative and logistic issues that could be resolved, but to what extent greatly depends on school administration and the head teacher/principal.

Finally, when conversing about the skills needed for teachers to act as agents of change, dexterity in locating new information and knowing where to look seems to be the key feature recognized by the focus group participants. This of course does not undervalue possessing necessary pedagogical and subject matter knowledge, or adapting and developing one's own practice accordingly. Teachers emphasize how "finding information" is not only important for the purpose of showing new examples to students, but is also important in keeping up-to-date in the ability to use available technologies.

“Only a good, dedicated practitioner can make positive changes in education. Therefore it is necessary these teachers to use contemporary teaching models.” (primary school teacher, Montenegro)

“It is sometimes hard for our generation to cope with new technologies, projectors, new media, but we have to learn these as well and be well acquainted with it. This is the fear of our generation.” (primary school teacher, Bosnia and Herzegovina)

Following these findings, we focused specifically on those related to the issue of availability and usage of ICT in the everyday lives and work of teachers. According to teacher reports, half of the teachers in the sample often or very often use a variety of websites and social networks to keep in contact with family and friends, one third uses social networking almost every day for fun, while two thirds use web browsers such as Google to obtain information. One third of the teachers in the sample pay their bills online. Overall, we can say that ICT is available to the group of respondent teachers. Almost all have personal computers and a computer is an available tool in their work place. The majority of teachers (80%) had completed some kind of course related to use of ICT. Furthermore, most teachers (91%) state that ICT-equipped classrooms exist in the school. According to our participants, two-thirds also have computers in their classrooms.

Overall, teachers participating in the study believe ICT can improve the teaching and learning process. Only 15% did not believe so. In particular, teachers agree that ICT can assist them in providing instructional materials that enhances the quality of teaching; usage of ICT has a positive effect on student motivation, and may enhance student participation in class. Although some differences are noticeable in the number of teachers in agreement that a particular feature is improved with the usage of ICT, the seven features in Table 1 related to student learning and teaching highly correlate with each other ($r(52) = .79$ to $.93$, $p < .01$).

In terms of perceiving their own competence in using particular software or online utilities, teachers mostly feel comfortable in dealing with word processors (e.g., Word), presentation kits (e.g., PowerPoint), and search engines like Internet Explorer or Chrome. Teachers feel least competent when

Table 1. How ICT Can be Utilized in the Classroom

I believe ICT can:	Do Not Agree at All	Less Agree	Agree More	Fully Agree
Improve the teaching and learning	15%	0%	33%	52%
Improve critical thinking	15%	8%	44%	33%
Enhance the participation of students in class	15%	8%	50%	27%
Improve cooperation between students	15%	8%	42%	35%
Improve interaction between students and teachers	17%	6%	44%	33%
Assists teachers in providing instructional materials that enhance quality of teaching	15%	0%	21%	64%
Has a positive effect on students motivation	15%	0%	35%	50%

Table 2. Perception of Own Competence and ICT

How Do You Assess Your Own Competencies to Use ...	Do Not Know How to Use	Basic Knowledge	More Capable	Fully Capable
Word processors (e.g., Word)	17%	8%	15%	60%
Tables and spreadsheets (e.g., Excel)	15%	23%	37%	25%
Presentation kits (e.g., PowerPoint)	15%	14%	15%	56%
Data bases (e.g., Access)	37%	25%	16%	22%
Search engines (e.g., Google)	15%	8%	13%	64%
Mail service (e.g., Gmail)	21%	14%	19%	46%

dealing with databases. If we look closely at these results, it is obvious they correspond significantly with those related to usage of ICT in everyday life.

Teachers find a variety of information through search engines, but use various websites to maintain social contacts. No contact is provided, for example, with any database in that way. This is in line with the results obtained on how ICT is used in teaching. On an everyday basis, a very small number of teachers in the sample use ICT (6–10%). This is especially important if we consider the fact that all teachers participating in the study are involved in the teacher leadership program and that all develop their own small scale projects to foster participation of their students.

Table 3. Usage of ICT at Work (in Teaching)

I use ICT in teaching for...	Not at All	Occasionally	Often	Every Day
Instructing students	29%	37%	24%	10%
Communication with the students	33%	36%	25%	6%
Organization of discussion in class, presentations and (or) demonstrations	18%	31%	41%	10%
Assessment of students' progress (tests and excursions)	29%	47%	14%	10%
Feedback to students	45%	22%	27%	6%
Fostering cooperation among students	30%	24%	36%	10%

Among the several possible ways in which ICT can be used in the process of teaching and learning and organization of discussion in class, presentations and demonstrations take the leading position, being used “often” by 41% of teachers in their teaching. However, this frequently takes the form of a PowerPoint presentation shown to students without any in-depth discussion on the topic.

The striking result is the fact that 46% of teachers never use ICT as a tool to provide feedback to students. In an era where ICT is the dominant form of communication, especially for the younger generation, such

neglect of a possible channel to improve ties with students is surprising, especially among teachers who have access to ICT and who feel competent in using it in such a manner.

Discussion

The purpose of this study was to explore the competences teachers participating in the Advancing Teacher Professionalism for Inclusive, Quality and Relevant Education (ATEPIE) project perceive as most important and necessary in everyday classroom routines, bearing in mind the demands of current reforms in the SEE region. In respect to usage of ICT in schools, we wished to address teachers' current practices in the field and the extent to which teachers perceive ICT as a tool that enriches the learning environment and thus, their everyday practice.

Respecting teacher competences, it is worth noting that the teachers who participated in the study intuitively recognize the traits, knowledge, skills, and attitudes they need to efficiently handle various teaching and learning situations. They all recognize creativity, innovativeness, and readiness to change and learn as important qualities. Communication and cooperation skills, as well as tolerance and flexibility, are also recognized as important features that teachers today must have. In brief, it can be concluded that teachers are aware that the competences they need are those required to support learning and improve dedication of the entire school culture to the improvement of student achievement and motivation to learn and progress. Finally, it is important to point out that the characteristics teachers discussed were the characteristics they possessed as voluntary participants in the ITL. Therefore, motivation for participation in the study was exclusively intrinsic and directed towards the improvement of own work quality. Most teachers are involved in various school projects and teacher training seminars. It was important for participant teachers to learn and improve their own abilities and capacities through the ITL program.

If we accept the assumption that teachers can generate social and educational change (Freire, 1970) and that the most successful teacher leaders are skilled in their pedagogy, well versed in their subject matter, and politically conscious in the sense that they know their work makes a difference (Nieto, 2007), then teacher statements that they need to employ various teaching methods and adapt them to the needs of students provides a basis for a strong belief in the capacity of teachers to act as change agents. Teachers in our study recognized interactive learning as a learning mode that provides students with opportunities to benefit from their prior experiences and previously acquired knowledge, while the responses provided by the teachers clearly show their awareness of the complexity of their role as a teacher and the overall responsibility and social significance of the teaching profession.

It is clear that teachers believe the activities performed by a teacher acting as an agent of change can be implemented at different levels: on an individual level (improving the professional education of teachers), at the school level, and at the education system level. But the individual level dominates teacher perceptions. One skill all teachers recognized as crucial is the readiness to learn, using both formal and non-formal opportunities. In this paper we have explored the issue of the use of ICT in the classroom and the beliefs that doing so contributes significantly to the learning process. Although the sample of teachers participating in this study is far from representative in terms of the teacher corpus among the five countries, results of the analysis point to the gaps in the teacher belief system and their day-to-day routines when it comes to ICT.

Although usage of ICT is seen as a tool that significantly contributes to the teaching and learning process, especially in the domain of enhancing student motivation and contributing to the quality of instructional material used in the classroom, only a small number of teachers in the study reported actually using ICT on a regular basis. Again, we note that these are teachers who are involved in various school projects and who emphasize the importance of learning and improving their own abilities and capacities. Also, to all study participants, ICT is available (i.e., computers are accessible in their schools, in their classrooms, and in their homes).

As previously stated, agreement exists in the literature that ICT provides many ways to improve teaching and learning, while it is acknowledged that

ICT integration into existing educational programs is a complex process (Balanskat, Blamire, & Kefala, 2006). In this particular case, among the teachers in this study there seemed to be no major barriers that hinder usage of ICT. Most teacher respondents were positively oriented towards the usage of ICT and there was no report of insufficient technological infrastructure, software, Internet connectivity, or technical support. But the gap does exist. One should ask whether the main obstacle is, as one teacher said, “the generation gap.”

Teachers noted that it was difficult to cope with all the changes they faced, including the utilization of ICT. Some of our results confirm this position. The narratives of the teachers themselves about the importance of learning throughout life indicate that a significant number of them do not feel competent in the use of large databases, tables, and spread sheets. To some, even using an e-mail service presents an obstacle, despite having identified the positive value of ICT. Law and colleagues (2008) note how ICT in the classroom has an effect on the pedagogical methods employed by teachers, but also note that teachers need to possess adequate knowledge to deal with ICT in their own classrooms and to use it in a purposive way. Although 80% of respondent teachers passed some sort of training related to utilization of ICT, we may speculate that the level of available support is not continuous, and that this seriously contributes to the reported gap between beliefs teachers hold, their perceptions of their own competence, and actual classroom practice. Only when teachers are confident in their own abilities will they try new teaching methods using digital technologies, and only then will these more visibly affect everyday teaching practices. At the moment, for the majority of the 52 teachers who participated in our study, ICT is still something they do not fully grasp. It is used in everyday life to socialize and find new information, but only 10% of the respondent teachers find ways to use ICT in teaching on a daily basis. To others, this is a goal they may reach at some point in the future. Since there is currently no agreement about the desirable level of ICT competence that a teacher should possess, especially in the Western Balkan countries, the process of getting all teachers to include ICT in their daily teaching strategies will continue to be slow.

Conclusions and Recommendations

Despite the fact that the teachers who participated in the study reported availability of ICT in their classrooms, broad usage of ICT in everyday life, and their overall positive orientation towards general usage of ICT, a gap between everyday life usage of ICT and their own teaching practice does exist. Because this disparity may be due to varying factors, recommendations are given for different policy levels.

System Policy Level

Despite the fact that the value of ICT in education is recognized in all countries included in this study, the “missing link” of their educational strategies lays in the fact that there is no unified, comprehensive strategic approach that takes into account the ICT needs at all levels of education, as well as the ways in which systemic data on how ICT is used in education may be collected. In other words, the national strategies and legislation in the field of education should have stronger references to ICT literacy and should be better harmonized with 1) EU policies and legal frameworks related to digital competence and 2) recommendations on the collection of systemic data using the same methodology. The role of ICT should become an integral part of the general outcomes of education in all Western Balkan countries and should not lag behind the role that ICT already has in daily life of both students and the teachers.

School Policy Level

Legislation should be adopted for schools and a team be formed to plan and integrate ICT into the teaching process in a manner that is in line with recommendations in the UNESCO document, *Information and Communication Technologies in Teacher Education: A Planning Guide* (UNESCO, 2002), which recommends that formation of such a team be at the educational institution level. The team would assist teachers in

finding the most adequate content, tasks, and exercises (in the subjects they teach) for the topics they plan to cover using ICT. In this way, existing ICT competencies of teachers are fostered and teachers will receive support to acquire new ones.

Schools should be supported and encouraged to provide a higher degree of networking and exchange of experience between experts and teachers with experience in the application of ICT in education to enable a quicker transfer of knowledge and usage of experiences that have come as a result of a number of projects and initiatives in this area.

Teachers' Pre-Service and In-Service Training Policy Level

It is necessary to pay special attention to ICT competence in preparing future teachers for the teaching profession. The ideal solution would be a compulsory subject or module during initial education at pedagogical faculties.

During in-service teacher training, it is recommended that compulsory ICT training programs be introduced to teachers as part of their professional development. These training programs should include both basic theoretical concepts and principles of developing multimedia content, as well as development of multimedia teaching and learning materials. If possible, these training programs could become a compulsory part of the teacher licensing and relicensing process.

In countries where reference to ICT application does not exist, standards of teacher competencies and standards for the teaching profession should be amended to include indicators that measure levels of ICT competency.

Limitation of the Study and Further Research

The study presented in this paper was a small-scale study focused on a specific group of teachers—participants in the ITL program. Thus, it is not a representative sample of the teacher body of the Western Balkan countries. Considering the topic of this paper and its focus on teachers acting as agents of change and their utilization of ICT in everyday practice, we may argue that the sample used is the most favorable one. Thus, further research will focus on teachers from ISCED 1 to 3 (primary and secondary education), but will take into account a regular and more representative sample of teachers and will explore their beliefs and practices relating to usage of ICT. Given that in-service professional development programs target these educational levels, the lack of data on the topic in the region, and the emphasis on usage of ICT, we consider the present and planned study will significantly contribute to evidence needed when determining effective policies.

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6 Prospective Teachers and New Technologies: A Study among Student Teachers

Anne Huhtala

Abstract

This paper reports on a study whose aim was to examine how student teachers relate to the use of new technologies in teaching. The use of technology in all areas of our lives is increasing rapidly, affecting society in a profound way. It is often taken for granted that teaching is also affected by this change. However, changing traditional teaching methods is a long and complicated process that requires new ways of looking at the relationship between a teacher and student, and at human and technology interaction. At the beginning of 2013, I collected data from 44 prospective language teachers at the University of Helsinki about different aspects of using new technologies in teaching. One half of the students had no teaching experience, whereas the other half had at least some teaching experience. The study revealed some interesting differences between the two groups. Students with teaching experience were more uncertain about whether their skills in using new technologies in teaching were sufficient. Even when mostly positive towards using new technologies in their own teaching, they seemed more aware of the risks and hazards of the increasing use of technology. Many informants in both groups commented on the problems schools and teachers had keeping pace with technological developments. As these students plan to become language teachers, this

study can give new and useful information about why teachers either favour new technologies in their own teaching, or alternatively, are critical towards using learning technology.

Keywords: New Technologies, University Students, Student Teachers, Teaching and Learning, Teacher Education

Introduction

The use of technology in all areas of our lives is increasing rapidly, which affects society in a profound way and demands new skills and competences of everyone. Naturally, what happens in society at large has consequences on teaching and learning (and vice versa), as well as on teacher education. I see teachers as key persons in implementing new practices in schools, even if they obviously need the support of actors that are both external, e.g., municipal, and internal, e.g., school principals (Owston, 2007).

Student teachers of today are the teachers of tomorrow, which makes their skills in and attitudes towards the use of new technologies in teaching and learning significant. As Yuen and Ma (2008) state on the basis of several studies, teacher attitudes and acceptance of technology are central to their preparedness for using technology in their teaching.

This paper reports on a study conducted at the beginning of 2013. The aim of the study was to examine how prospective language teachers see their own ability to use new technologies and how they feel about using information and communication technologies (ICT) in their teaching in the future. When I use the term *new technologies* in this paper, I refer to all kinds of modern technologies that can be used to support and enhance learning, such as social media (e.g., YouTube, blogs, Facebook), interactive whiteboards, e-learning platforms, and so on.

I believe it relevant to study how student teachers see their own skills in using ICT, and whether they think their university studies have provided them with sufficient knowledge and skills to use ICT in the classroom as a teacher. New information on this subject can hopefully help plan for

the education of student teachers and support them in their professional development.

My research questions are as follows:

- a) How do university students who are studying to become language teachers evaluate their own skills in using new technologies?
- b) What do these students think about the use of new technologies in teaching?
- c) What benefits and problems do they see in using new technologies in schools?

Background

Especially in Western societies, computers in classrooms, at home and at work are seen as more or less self-evident. We even talk about *Society 3.0* (Moravec, 2008; van den Hoff, 2011), referring to the rapid changes in our globalized world that require innovation, creativity, and a new way of looking at knowledge and knowledge production. As the world changes, education must also change to meet the new challenges. Researchers have begun using the concept of *Education 3.0* for this new, creative, educational generation that in many ways (and in many parts of the world) is still more of a vision or a future goal than reality. This new technological and pedagogical change naturally affects the way education is planned. In Finland, the Finnish National Board of Education (FNBE) has initiated a project called *School 3.0* in its attempt to increase the use of social media in basic education (FNBE, 2010). According to the Basic Education Act (628/1998, Ch. 1, Section 2:1), the objective of basic education is “to support pupils’ growth into humanity and into ethically responsible membership of society and to provide them with knowledge and skills needed in life”. In today’s world, the use of new technologies can be regarded as a basic skill required of all pupils.

Keats and Schmidt (2007, Three generations of education, para. 1–3) describe the three educational generations in the following way:

“Education 1.0 is, like the first generation of the Web, a largely one-way process. ... Students are largely consumers of information resources that are delivered to them, and although they may engage in activities based around those resources, those activities are for the most part undertaken in isolation or in isolated local groups. ... Education 2.0 happens when the technologies of Web 2.0 [participation technologies] are used to enhance traditional approaches to education. Education 2.0 involves the use of blogs, podcasts, social bookmarking and related participation technologies but the circumstances under which the technologies are used are still largely embedded within the framework of Education 1.0. ... Education 3.0 is characterized by rich, cross-institutional, cross-cultural educational opportunities within which the learners themselves play a key role as creators of knowledge artifacts that are shared, and where social networking and social benefits outside the immediate scope of activity play a strong role. The distinction between artifacts, people and process becomes blurred, as do distinctions of space and time.”

However, as Keats and Schmidt (2007, Three generations of education, para. 7) write, “We are still far from Education 3.0, even Education 2.0 is not as widespread it is [sic] might seem to the already initiated, especially in the developing world and particularly in Africa” (see also Keats, 2009). Although they wrote their article several years ago, their comment can still be seen as relevant. The shift from Education 2.0 to Education 3.0 is not automatic, but will require the involvement of many actors in education.

In her pilot study of 26 young (aged 18–24) undergraduates’ use of new (Web 2.0) technologies, Kumar (2010) found out that her informants used new technologies quite frequently for personal purposes, but much less for educational purposes. In addition, they were mainly consumers of content, not producers. However, they saw many benefits in the use of e.g., Podcasts and Online videos in education, and made suggestions about how technology could be used in teaching and learning.

Using technology in classrooms is in itself not a new phenomenon. But integrating technology and learning has never been unproblematic. As Wang and Reeves (2003) declare on the basis of their overview of several studies, using television and other older technologies in teaching

and learning was no success. They also ask whether newer (computer) technologies will “repeat the failure” (p. 49) of older technologies. Very often, the unsuccessful integration of learning and technology is seen as a result of teacher and learner resistance. But according to Wang and Reeves (2003, p. 55), the reasons are more complicated: teachers find it difficult to combine constructionist pedagogy that using computers in classrooms entails, with other central requirements and expectations affecting the work of teachers, such as maintaining discipline and improving the test grades of their students. These kinds of comments are relatively common also in today’s schools.

Computers in schools are seen as necessary in order to “prepare students for their e-future” (Wang & Reeves, 2003, p. 54), and new technologies are regarded as a central part of teaching and learning. However, one of the problems of new technology is that it very soon becomes “old” technology. As Wang and Reeves (2003) state, “A ‘new’ computer with latest technologies is likely to become inadequate to utilize the latest software and operating systems after just a few years of use Rapidly changing technology will only accelerate in the future” (p. 54). Wang and Reeves (2003) also take up the need for more support for teachers, as well as the need for a closer collaboration with researchers.

Owston (2007) has studied classrooms and schools where the use of pedagogical innovations has been successfully sustained. He concludes:

“Essential conditions for the sustainability of classroom innovation were teacher and student support of the innovation, teacher perceived value of the innovation, teacher professional development, and principal approval. Contributing factors for sustainability were supportive plans and policies, funding, innovation champions, and internal and external recognition and support” (p. 61).

He thereby sees the role of teachers as central in sustaining the use of new technologies. As he states, without teacher support, innovation is not possible. In order to continue using new technologies, teachers must see the use of technology as valuable and meaningful, and they must acquire the necessary technical skills and knowledge to use them effectively through formal or informal learning (Owston, 2007). Interestingly, Yuen and Ma

(2008), in their study concerning teacher acceptance of e-learning technology, came to the conclusion that perceived usefulness did not predict the intention to use e-learning technology. Instead, “contrary to previous literature, perceived ease of use became the sole determinant to the prediction of intention to use” (p. 229) and perceived ease of use was “predicted by computer self-efficacy” (p. 236), i.e., how well teachers believed they could use computer technology. It is worth acknowledging, however, that the results of Yuen and Ma deviate from those generally found in studies utilizing the Technology Acceptance Model. For example, in his study concerning primary school teachers’ technology use, Haaparanta (2008) found that perceived usefulness predicts future computer use much better than perceived ease of use.

There are those who comment about the risk that computer use will make learning lonelier, isolated, and even anti-social; the critics have found it a challenge to combine effective learning with the use of new technologies (see Stahl, Koschmann, & Suthers, 2006). Computer-supported collaborative learning (CSCL) has been offered as a possible solution to this problem. According to Stahl et al. (2006), CSCL is not the same as individual learners co-operating with each other; instead, it means constructing meaning together with others, learning in collaboration. This interaction and joint knowledge construction is *supported* by technology, not replaced by it.

Later in this paper, I discuss my results in light of the studies presented in this section. While the main purpose of this small study is to draw a “sketch” of the phenomenon, I hope the results presented here can be used to determine how best to support student teachers in their ICT use, an important aspect of their professional development.

Data and Method

The data for my study were collected at the beginning of the 2013 spring semester. My informants were university students studying at the University of Helsinki with the aim of becoming language teachers in the future. All the students have Swedish as either their major or as one of their minor subjects.

The data were collected anonymously and participation in the study was completely voluntary. I used a questionnaire consisting of 10 open-ended questions about the use of new technologies in teaching and learning. I gave a short introduction on the purpose of the study and invited the students present to complete the questionnaire. Almost all students who heard about the study were interested and wished to participate. In return, I promised to inform each student (i.e., the 44 informants and all others in attendance for my presentation) of the preliminary results of this study. As only three of the informants were male and because their answers proved not to differ from the answers of the female informants, I will not distinguish between the responses of male and female student teachers.

For my analysis, I divided the informants into two groups, those who reported having no teaching experience at all (Group 1: $n_1 = 22$ students) and those who reported having at least some teaching experience (Group 2: $n_2 = 22$ students). To analyze the data, I used a combination of quantitative and qualitative analysis. The analysis is mainly qualitative, consisting of thematic content analysis (Zhang & Wildemuth, 2009; Kohlbacher, 2006; Tuomi & Sarajärvi, 2004; Eskola & Suoranta, 2003). The responses of the informants were coded and then organized into thematic categories separately within each group (i.e., Group 1 and Group 2). Quantitative analysis (presented as numbers and percentages) was used to compare the two groups concerning the informants' reported skills in using new technologies, their plans for using new technologies in their own teaching practice, and their evaluation of whether they had acquired enough knowledge and practice using ICT during their university studies, including their teacher education.

As the number of informants in my study was only 44, I do not expect that the results can be generalized. The results concern this special group, but can be seen as an interesting statement concerning the role of ICT in teacher education. The informants gave their answers in Finnish. The text fragments from the answers that I use in this paper to exemplify some relevant points were translated from Finnish to English by me.

Results

Prospective Language Teachers and New Technologies, Quantitative Analysis

The informants were asked to comment on what they thought about using new technologies in their own teaching. The answers were categorized as either positive or doubtful (Table 1). The *doubtful* category included responses that indicated a slightly negative or hesitant attitude towards using new technologies. A couple of informants gave no answer to this question, and I interpreted the non-response as an expression of hesitancy and therefore categorized these non-responses as doubtful.

Table 1. Attitude towards Using New Technologies in Own Teaching

	Positive	Doubtful
Group 1 (no experience) (n ₁ = 22)	10 (45.5%)	12 (54.5%)
Group 2 (with experience) (n ₂ = 22)	15 (68.2%)	7 (31.8%)
Groups 1 & 2 (n = 44)	25 (56.8%)	19 (43.2%)

The majority of informants, 25 student teachers (57%), were unreservedly positive towards using new technologies in their own teaching. Intriguingly, those with at least some teaching experience (Group 2) were more positive than those with no teaching experience (Group 1). As many as 15 informants (68%) in Group 2 were entirely positive, versus 10 positive informants (45.5%) in Group 1. The informants' own teaching

experience seems to have affected their attitudes towards the use of new technologies in teaching, making them more positive.

The informants were also asked to evaluate their own skills in using ICT. The results can be seen in Table 2.

Table 2. Evaluation of Own Skills in Using ICT

	Positive	Doubtful
Group 1 (no experience) ($n_1 = 22$)	7 (31.8%)	15 (68.2%)
Group 2 (with experience) ($n_2 = 22$)	3 (13.6%)	19 (86.4%)
Groups 1 & 2 ($n = 44$)	10 (22.7%)	34 (77.3%)

It became clear during analysis that the informants often evaluated their skills as deficient or poor. Only 10 informants out of 44 (23%) regarded their own skills as sufficient, whereas the remainder (34 informants, or 77%) either saw their skills as unsatisfactory or were uncertain. A couple of informants gave no answer to this question, which I saw as a sign of doubtfulness. Only 7 informants in Group 1 and 3 informants in Group 2 were completely content with their skills. What is notable is that those with at least some teaching experience regarded their skills as more deficient than those with no teaching experience. It may be that their prior experience in schools had made them more aware of the skills they still needed to acquire.

The informants were also asked to evaluate whether they had acquired enough knowledge about using new technologies and sufficient opportunity to practice the use of ICT during their university studies (see Table 3).

Table 3. Enough Practice in and Knowledge about ICT during University Studies

	Yes	No/Doubtful
Group 1 (no experience) ($n_1 = 22$)	3 (13.6%)	19 (86.4%)
Group 2 (with experience) ($n_2 = 22$)	2 (9.1%)	20 (90.9%)
Groups 1 & 2 ($n = 44$)	5 (11.4%)	39 (88.6%)

Only 5 informants out of 44 (11%) were content with the amount of knowledge and practice they had acquired during their studies, whereas the remainder, as many as 39 informants (89%) regarded the amount of practice as insufficient, or expressed their uncertainty in some way. There was a negligible difference between Group 1 and Group 2 in this respect: both those with teaching experience and those without would have liked to have acquired more knowledge about ICT and more practice during their university studies, especially during their teacher education. They regarded their skills as deficient, and therefore the use of ICT as difficult, which may raise concern in light of the study of Yuen and Ma (2008) who found that perceived ease of use predicts intention to use.

Benefits Connected to Using New Technologies

One question concerned the benefits that the students saw in using new technologies. All students saw at least some benefits, and some gave long lists of (potential) advantages connected to using different kinds of learning technologies.

I collected the most frequently mentioned benefits for both Group 1 and Group 2 in Table 4 below. The most commonly noted aspects are listed first, the less frequently mentioned are lower on the list. Interestingly, the benefits mentioned by the two groups were very similar. However, some differences could be noted between the groups and are marked in italics in Table 4.

Table 4. Benefits Connected to Using New Technologies in Teaching and Learning

Group 1 (no experience)	Group 2 (with experience)
1 Motivating & activating	1 Motivating & activating
2 More interesting	2 Makes teachers' work easier
3 Combines students' free time and school	3 <i>Different learning styles and special groups can be taken into account</i>
4 Makes teachers' work easier	4 More interesting
5 <i>Interactive & social</i>	5 Combines students' free time and school
6 <i>Fast</i>	6 <i>Combines ICT & subject knowledge</i>
7 Versatile	7 Versatile
8 <i>Modern</i>	

What both groups saw as most positive in using learning technologies, was that it could motivate and activate students. There were many responses that suggested these benefits. “Students would probably be more motivated if e.g. social media was used more – young people use it daily. New ways of activating students could be found” (Example 1, Group 1). “Students use these technologies (e.g. social media) in their everyday lives; the use of technology makes them more motivated, and probably activates them” (Example 2, Group 2).

Many informants in both groups regarded the use of learning technology as a way of making teaching and learning more interesting, and saw it as a good way of combining students’ leisure time and school. Quite a few students in both groups saw ICT use as versatile and as a means of making teachers’ work easier: “It probably makes teachers’ work easier as old chalkboards become history. Versatile materials and versatile teaching methods can be used” (Example 3, Group 1).

Many of the students with no teaching experience (Group 1) saw computer-supported teaching and learning as interactive and social, fast and modern, whereas students with teaching experience (Group 2) noted other features. Many of them commented positively on the possibility of considering different learning styles (by using sound, visual props, etc.) as well as adjusting their teaching to various kinds of special groups. They also liked the idea of combining ICT and subject knowledge in their own teaching. “Teaching becomes more visual when ICT is used. At least some students may find it easier to learn by means of new technologies. Besides, students learn about the subject and about ICT at the same time” (Example 4, Group 2).

These comments show that many informants regard the use of ICT as meaningful, which can be seen as an important factor in continuing to use learning technologies in their (future) work as teachers (Owston, 2007; Haaparanta, 2008).

Challenges Connected to Using New Technologies in Teaching and Learning

Students were very much aware of the challenges that using learning technologies entails. The most common challenges and problems noted by informants are listed in Table 5.

Table 5. Challenges Connected to Using New Technologies in Teaching and Learning

Group 1 (no experience)	Group 2 (with experience)
1 Technical problems & complicated software	1 Technical problems & complicated software
2 Potentially undemocratic (schools & students)	2 Potentially undemocratic (schools & students)
3 Teachers' lacking skills	3 Too much time spent using ICT: face-to-face interaction can suffer; social skills may deteriorate; can cause ICT-addiction
4 Too much time spent using ICT: excess information; concentration problems	4 Entertainment can become more important than education
5 Time consuming	

The complaint most often noted by students in both groups had to do with problems using technology, related to both hardware and software. Technical problems were seen as a stress factor due to the amount of time wasted trying to solve the problem, the frustration caused, and the difficulty in using some software. The second most common problem that students in both groups commented on was that increased use of new technologies could potentially cause inequality. Some schools can afford the newest equipment and software, others cannot. As Wang and Reeves (2003, p. 54) state, new technology becomes out-of-date very quickly. This can cause problems for schools and municipalities that are not well-off.

Not everybody has a computer at home. Besides, computers and software don't work properly or teachers can't use them. There always has to be a plan B, if technology doesn't work as it should. Different schools have different resources for buying equipment. (Example 5, Group 1)

Very often something doesn't work properly – there are more problems with technology than with chalkboards. There is a risk of inequality between students, if for example homework must be done by using a computer. Not all students have the same opportunity of working with computers, and not all schools have the money to buy the newest technologies. (Example 6, Group 2)

Many of the informants commented on the problem (both ethical and practical) that even if everyone is expected to use modern technologies, there are still schoolchildren and young people who—for different reasons—do not have a computer at home and who do not use ICT in their free time. These students are at a disadvantage compared to “digi-natives.” This can cause feelings of inferiority and sadness, according to the informants. Some mentioned their own experiences of feeling inadequate, as well as being laughed at because of problems using ICT. If these informants are not supported in the acquisition of the necessary skills through formal courses or by means of informal learning, they probably will not have the courage to use ICT in their own teaching.

Some of the informants in Group 1 mentioned the lack of skills of many teachers as a challenge, as well as the problems caused by spending too much time using technology. According to some students, excessive use of ICT can lead to concentration problems, “infobesity” (information overload), and information fatigue. The amount of time spent in different virtual worlds is growing all the time, something that many informants see as a potential risk factor. There are children and young people who are more at home in their virtual realities than in the “real” world.

Children spend a lot of time using computers, at home and at school. They get information through all possible channels all the time. In this way, real communication, like looking other people in the eyes and discussing with them, may suffer. (Example 7, Group 1)

Some of the informants who had teaching experience commented on the fact that “too much [ICT use] is too much”; ICT-addiction is a real (and growing) problem, according to these informants. Some were adamant in stressing the importance of face-to-face interaction between teachers and

students on the one hand, and between students on the other. Real life contacts are also important in teaching and learning social skills, an aspect that was mentioned by some informants. This shows it is important to find a balance between new technologies and face-to-face interaction in education and to use ICT in a way that does not mean isolating students from each other, but facilitates collaboration between them. Computer-supported collaborative learning has been suggested as one solution to this problem (Stahl et al., 2006). “Addiction to ICT, excessive use, can cause concentration problems, etc. Technology surrounds us wherever we are, and children use computers anywhere and everywhere. Human contacts suffer” (Example 8, Group 2).

Some informants in Group 2 also commented on the risks of “edutainment” (educational entertainment): everything has to be fun nowadays, and entertainment (funny videos, exciting games, etc.) has become more important than education. Some respondents queried whether this development had gone too far.

Special ICT Issues Taken Up by Informants

Surprisingly, many students in Group 1 reflected on the conflict between new technologies as a source of loneliness and isolation on the one hand, and as a social and interactive activity on the other (Table 6).

Table 6. Special ICT Issues Taken Up by Informants

Group 1 (no experience)	Group 2 (with experience)
Makes both learning and learners more social and interactive vs. Can be very lonely – everyone uses his/her own iPad; can cause isolation and lack of interaction	The money used in new technologies should be used for other purposes: e.g., repairing school buildings, smaller groups, education of teachers, and class assistants vs. If used properly, with reflection, can be relevant, social, inspiring, and interesting

Some informants most worried about using ICT in schools commented on the inherent nature of Finns to be quiet and shy. They saw the increasing use of learning technologies as an additional threat; everyone staring at their iPad in isolation was mentioned by several informants. “Learning could become more isolating and lonely, asocial. Why use computers for communicating when you sit in the same classroom, side by side?” (Example 9, Group 1).

While many informants without teaching experience were worried about ICT isolating pupils, the informants with teaching experience were more concerned about other things. Experiences in different schools had made many of them acutely aware of the problems that several Finnish schools are dealing with at the moment. They worried about whether the money used on ICT would be better used to tackle some of the problems they had become aware of during their work experience: school buildings requiring repair, big groups, the need for class assistants, etc. Also, the necessity to educate teachers came up in the responses.

The money used on new technologies could perhaps be used in a more useful way. Quite a few school buildings are in need of repair. It would also be important to get more class assistants and smaller groups. I think these kinds of things come first, technology comes second. (Example 10, Group 2)

However, none of these informants were categorically against using learning technologies. Instead, they thought ICT use could be inspiring and interesting, for both teachers and students, and it could also make learning more social—on the condition that it was used properly and with reflection.

Discussion and Conclusions

The results of this study proved to be quite interesting and also brought up many things that worry the informants. In this section of the paper, I discuss some of them. The data I collected include only the responses of 44 informants, which means that the results of my analysis cannot be generalized to all prospective language teachers. Nevertheless, in my opinion, they provide valuable new information on the thoughts of university students about using new technologies in teaching and learning. This information can also be useful in developing teacher education.

My first research question was about prospective language teachers' evaluation of their own skills in using new technologies. The results show that the lack of ICT skills was experienced as a real problem; there were many comments from informants about lacking the skills needed to use ICT themselves. Several student teachers also reported their own experiences with not having acquired sufficient knowledge and practice using new technologies during their university studies, not even during their practicum periods. This is a very interesting comment because all respondents had compulsory ICT education through their faculty and their language department. Additionally, these language students have the option of attending as many elective ICT courses as they desire during their university studies. Because I have not had the opportunity to interview these students, I can only speculate about the reasons for these experiences. It is possible that what they may, in fact, be missing is the pedagogical component of ICT use, that is, determining when and how to use technology in teaching and learning.

This issue is something that we, as educators, must take seriously. If these university students do not feel they are prepared for their “e-future” (Wang & Reeves, 2003, p. 54) or even for today's needs, we can hardly expect them to be capable of supporting their own pupils in learning the skills necessary in the knowledge society of tomorrow. As computer self-efficacy affects users' perceived ease of use, which may further affect their intentions to use computer technologies in the future (Yuen & Ma, 2008), it is important to offer student teachers opportunities to practice ICT use.

However, practicing technological skills out of context cannot be seen as adequate; also the pedagogical aspects of ICT use should be taken into account (Haaparanta, 2008). Many of the informants expressed a strong wish to learn more, but they were uncertain as to where to start. One of the informants, a student who is already working part-time as a teacher, writes, "I would love to get more skills in and information on this subject, but I really don't know where to ask for them."

My second research question had to do with student teachers' thoughts about the use of new technologies in teaching. Many informants seemed to have mixed feelings about the matter and reflected on how to find a balance between using new technologies and face-to-face learning. They commented on the inappropriate and excessive use of ICT and its possible hazards; for example, it may make pupils more isolated and lonely and thus lead to deficient social skills. They saw ICT as a useful tool and a valuable support for teaching and learning, but only on the condition that it does not replace human contact between pupils on the one hand and between teachers and learners on the other. Combining ICT use and collaboration (Stahl et al., 2006) can therefore be seen as important. Some student teachers were also worried about pupils who do not have a computer at home or who find ICT use difficult or even frightening. These pupils obviously need support and encouragement to overcome their fears.

Many of the informants commented on the technical problems that are connected to new technologies, both computers and software. This is a real problem that everyone involved in teaching has experience with. How to solve the technical problems connected to computers and how to make educational software even more user-friendly, practical, and inspiring are questions worth considering. Using e-learning technology should be experienced as useful so as to make it worthwhile for teachers to start and keep using it (Haaparanta, 2008).

In my third research question, I was interested in discovering what benefits and problems prospective teachers saw in using new technologies in schools. The results show that they saw many benefits but also several problems. They were worried about the fact that different schools and municipalities have different economic resources to invest in new technologies; some schools also have less financial resources than others to deal with

the other problems they face. Inequality between municipalities, schools, and pupils is a real ethical, as well as practical, problem, even in a “model” country like Finland in terms of modern education. As one of the student teachers remarked, these things come first, technology comes second.

As it is now, Education 3.0 still seems to be more of a vision than a reality (Keats & Schmidt, 2007) in our society, even in higher education (see Kumar, 2010). It is therefore important to reflect on and discuss the problems and worries indicated by these university students. Especially, the pedagogical aspects of ICT use seem to require a stronger focus. This is something that everyone working with student teachers should take into account, and it is a central issue for future research.

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7 E-Portfolio as a Tool for Guiding Higher Education Student Growth to Entrepreneurship

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Abstract

Since European knowledge-based societies are committed to develop individuals through lifelong learning, citizens require information, guidance, and counselling more than ever before to make proper education and career choices and to acquire the right skills for successful adjustment to their environments (Cedepof 2008, p. 7). We focus on introducing an entrepreneurship-portfolio (Entre-Pofo) model and preliminary experiences of students who have used it. Entre-Pofo is developed to promote higher education entrepreneurial student learning and growth in entrepreneurship. The theoretical foundation of the Entre-Pofo model lies in constructive learning that is also the theoretical basis for lifelong learning, guiding and counselling practices. The Entre-Pofo is also guided by the holistic counselling model, which considers life to have several intertwining dimensions: education, work and career, and family life.

The paper described action research in which teachers and entrepreneurship students construct a first version of the Entre-Pofo model. Preliminary experiences show that the model helps the students to manage their multidimensional learning processes and personalize learning outputs. Teachers feel that the model “relieves them from teaching” and it helps them to orientate, motivate, guide, and challenge their students’ learning

practices. The significance of this paper is the presentation of the Entrepofo model as a tool to guide students in their lifelong learning processes towards professional and entrepreneurial growth.

Keywords: ePortfolio, Lifelong Learning, Lifelong Guidance, Counseling, Growth to Entrepreneurship

Introduction

The need to improve lifelong learning opportunities and lifelong guidance are the key issues in European-level educational policy. Lifelong learning acquires a new approach for learning, i.e., a change from teacher-directed to learner- or self-directed learning. Based on their literature review, Raemdonck, van der Leeden, Valcke, Segers, and Thijssen (2012, p. 574), define self-directed learning as “a tendency to take an active and self-starting approach to work-related learning activities and situations and to persist in overcoming barriers and setbacks to learning.”

The lifelong learner also needs appropriate tools and support, such as information and professional guidance. According to Cedefop (2011), the debate has been concerned with how career management skills can be exploited in different contexts, such as education, working, and free-time activities. These skills lead and support a learner’s motivation, confidence, and self-esteem, as well as a sense of responsibility for self and career aspirations.

The European Union has defined entrepreneurship as one of the key competencies of lifelong learning. In that context, entrepreneurship refers to an individual’s ability to turn ideas into action. Entrepreneurship includes creativity, innovation, and risk taking, as well as the ability to plan and manage projects in order to achieve objectives. According to this framework, entrepreneurship supports all citizens in everyday life at home and in society. It helps employees gain awareness of the wider context of their work and to capitalize on opportunities that arise. It also provides

the foundation for special skills and knowledge that entrepreneurs need when starting a social or commercial enterprise (European Union 2006).

The recent challenge in lifelong learning and guidance is how to manage and apply successfully modern information and communications technology (ICT) to guidance activities (Cedepof, 2011, p. 109). A rapidly changing environment and society demand changing skills and competences. Therefore, new innovative pedagogical and didactical systems are needed for employment, self-development, and participation in a knowledge-based, digital society. It is possible to personalize learning with the new tools of ICT so that learners become knowledge builders and creators rather than remain recipients of transmitted knowledge. The European educational policy on transparency and recognition of qualifications and competences is implemented in ePortfolio. It can be used as digital recordings of learning outputs and learners' products in different learning environments: formal, non-formal, and informal (Commission of the European Communities, 2008, pp. 12–13).

As entrepreneurship education is a central factor in lifelong learning, entrepreneurial skills should be developed and supplemented at different points in life. It is a question of life management, interaction, self-guided action, a capacity for innovation, and an ability to encounter change. Education and training help entrepreneurship evolve into a mode of operation in which attitude, will, and a desire to take action combine with knowledge and advanced competence. In general education, the emphasis is on positive attitudes, basic entrepreneurial knowledge and skills, and an entrepreneurial mode of operation. At the secondary level and in higher education, the knowledge and skills are developed further, including competencies relating to entrepreneurship (Ministry of Education, 2009). At the higher education level, the primary purpose of entrepreneurship education should be to develop entrepreneurial capacities and mindsets (European Commission, 2008, p. 7). The assumption is that entrepreneurial skills will better prepare students for careers in small and large organizations alike (Florin, Karri, & Rossiter, 2007, p. 18). In the context of the universities of applied sciences in Finland, entrepreneurship education programs can have various objectives.

According to the Finnish Ministry of Education (2009), entrepreneurship education is a much broader concept than entrepreneurship as a practice of trade. As a concept, it also encompasses training for entrepreneurship. Its components are an active individual with initiative, an entrepreneurial learning environment, education and training, and active and enterprise-promoting policy in society. Entrepreneurship education generates entrepreneurship at all levels of society and strengthens and creates business. The goal in entrepreneurship education and training in higher education is not to entice students into rushing off to become entrepreneurs, but rather to provide students with tools that enable realistic self-evaluation and support for student growth to entrepreneurship. Higher education students also need personal guidance and entrepreneurship studies that are based on their personal targets and needs. (Ministry of Education, 2009.)

In the process of developing our work, we determined that the target of entrepreneurship education and counselling at higher education can be expressed as:

- a) *Developing the entrepreneurial drive, i.e. raising awareness and motivation among students:* Motivation to study can also motivate students to decrease their study time to graduate earlier. Entrepreneurial drive is also pro-activity and passion that can influence students so that the number of students who do not graduate is diminished.
- b) *Developing students' entrepreneurial ability to identify and exploit opportunities:* These opportunities are not only business opportunities, but also opportunities to choose alternative courses, for instance, student exchange programs, taking part in projects concerning co-operation with work life and entrepreneurs, or other types of on-the-job learning.
- c) *Training students in the skills they need to set up a business, to develop an existing business, and manage its growth.* Some students also need skills to continue their family or other existing business.

In entrepreneurship education programs, students can learn many beneficial skills and adopt attitudes that will help them find their motivation to learn and graduate, to create their future vision, and to find their place in society and the labor market. According to Pittaway and Cope (2007) the target of entrepreneurship education is not only to create new businesses

and write business plans, new venture planning can simulate entrepreneurial learning by creating an environment for experiential, work-based learning. The literature and practical experience suggests that entrepreneurship can be taught, and that a creative environment encourages entrepreneurial thinking. They also suggest that guidance and education for entrepreneurship can stimulate the interest, skills, and confidence needed to take a business idea forward.

Using experience-based teaching methods is crucial when aiming to develop entrepreneurial skills and abilities. Usually, traditional educational methods (like lectures) do not inspire students to take risks, be actors in their learning process, or to develop their entrepreneurial thinking. Hence, there is a need for more interactive learning approaches, where the teacher becomes more of a moderator than a lecturer. The European Commission (2008, p. 8) emphasizes that crossing boundaries between disciplines and multidisciplinary collaboration are essential elements for building enterprising abilities. In our previous study (Römer-Paakkanen & Pekkala, 2008), students stressed that different assignments do not support learning if they are not embedded in real-life situations. As an example, they suggested that when writing a business plan in student groups, it would be better and more effective, in terms of learning outcomes, if at least one student in the group already had a real business idea. The traditional lecture format may not be the most effective method because it ignores the essence of the entrepreneurial process. Traditional approaches to teaching may, in fact, inhibit the development of the requisite entrepreneurial behavior or spirit.

In this paper the focus is to present the Entre-Pofo model as a tool to be used for reflection and guidance by entrepreneurship students. Kyvyt.fi ePortfolio service that is developed for Finnish educational institutions is used as a platform for Entre-Pofo. The service offers students and teachers versatile tools for creating and developing their own portfolio on the web. The service is integrated with web-based learning environments (Optima and Moodle), and at this stage users can register with the service through the online environments of member organizations. Kyvyt.fi is a software as a service (SaaS) platform developed and maintained by Discendum Oy.

The service is based on the open source software, Mahara. Discendum is an official Mahara partner.

By developing an Entre-Pofo model for higher education students, we aim to help potential entrepreneurs benefit from their work experiences, tacit-knowledge, and family business background to construct their entrepreneurial identity. Our context is business studies at HAAGA-HELIA University of Applied Sciences in Finland. Our target group is students at universities of applied sciences that take part in entrepreneurship studies or training, as well as the pre-incubator.

Targets of the Research and the Paper

The aim and purpose of this action research process originated from practice: there is a need for pedagogical models that promote pro-activity, entrepreneurial spirit, and skills among higher education students. We also need practical tools to help those students plan and reflect on their professional development and growth in entrepreneurship.

As we had previous experience with several development projects, we came into this project with a preliminary understanding of the theoretic baseline for our pedagogical model. As teachers and researchers, we have extensive experience in guiding and counselling higher education students, and based on this we decided to approach the problem of constructing the Entre-Pofo model along with a planning and reflecting tool from a student's point of view. We therefore invited entrepreneurship students to take part in the construction work with us.

In this paper we introduce the first stages of the action research process. As a result of this ongoing research, we present the first version of the Entre-Pofo model. We also introduce preliminary comments and results from the students and teachers that have been involved with the construction process and that have also used the pilot version. The first phases of our action research project presented in this paper have the following targets:

- 1) to outline the crucial elements for constructing the Entre-Pofo model,
- 2) to collect students' and teachers' first comments and experiences of using the Entre-Pofo.

In the next sections, we first present the theoretic background that was developed in our previous research projects concerning guidance and counselling processes in higher education. We then present the action research process and constructive research approach. As a result of the first stage of our research, we present the Entre-Pofo model and first user experiences. We also describe how we will continue the project and the construction work of the Entre-Pofo model in the future.

Main Concepts and Theoretical Background

According to Jarvis (2007, p. 5), human learning is the process of transforming the whole of our experience through thought, action, and emotion and thereby transforming ourselves as we continue to build perceptions of external reality into our biography. Jarvis (2007, p. 1) defines lifelong learning as follows: "Lifelong learning is the combination of processes throughout a lifetime whereby the whole person – body (genetic, physical and biological) and mind (knowledge, skills, attitudes, values, emotions, beliefs and senses) – experiences social situations, the perceived content of which is then transformed cognitively, emotively or practically (or through any combination) and integrated into the individual person's biography, resulting in a continually changing (or more experienced) person." Jarvis also points out that learning always occurs within a social context (Jarvis 2007, p. 12). Merriam (2001, p. 94) points out that "The field of adult education has long realized that formal learning activities are just one mechanism for adult learning. Self-directed learning helped bring to the fore the importance of the informal learning that occurs as we go about our daily lives."

In the Finnish education context, lifelong learning means that each person has sufficient opportunities to develop individual knowledge and skills in various learning environments in all phases of life. The principle

of lifelong learning is that knowledge and competencies are made visible and valued regardless of where, when, and how they are acquired (Ministry of Education and Culture, 2012, p. 15). According to Beynon and Harfield (2007, p. 43) :“The archetype for lifelong learning is adult education outside the schooling years through work (e.g. in training courses) and also for pleasure (e.g. night classes, etc.). It also embraces the kind of unsupervised, self-motivated learning that is associated with over-a-lifetime learning of specialist disciplines, hobbies and skills outside the classroom. There are reasons to suppose that current technology is well suited to supporting independent learning activities on the periphery of established educational frameworks. The environment that best suits the lifelong learner is then one that contains elements that are constructivist in spirit, and gives opportunities for learning by building.”

A variety of terms are used in the EU to describe lifelong guidance. In EU policy literature, lifelong guidance refers to such activities as advising, study and career counselling, competence assessment, and mentoring (Council of the European Union, 2004, p. 2; Cedepof, 2005). The Council of the European Union (2004) defines general guidance as a range of activities that enables citizens of any age and at any point in their lives (lifelong) to identify their capacities, competences, and interests, to make meaningful educational, training, and occupational decisions, and to manage their individual life paths in learning, work, and other settings in which these capacities and competences are learned and/or used (lifewide).

Generally, at the institutions of learning, guidance refers to the study counselling and to the information and consultation services that aim to guide the students so that their careers and life plans will be successful. The core task of guidance and counselling is to support the personal growth and development of the guided person (Kupke, 2008, p. 14). In higher education, institutional guidance can mean study counselling on various occasions, such as during info sessions, personal meetings, or small group meetings. It is important that students also receive guidance in their thesis seminars. There can be a great deal of variation in the form of guidance between universities or between faculties. Printed or electronic study guides, the Internet, and email are used as tools to help in guidance work. The themes of guidance sessions can be all of the following: briefing

the students, integrating them with the study environment or academia, and supporting their personal development (Levander, Kaivola, & Nevgi, 2003, pp. 171-173). In this paper and in our studies, we use the terms guidance and counselling almost as synonyms, depending on the context.

Peavy (1999; 2000) claims that counselling should be a process of assisting people to become eligible to participate more fully and with more meaning in social life. According to Tapio (2011, p. 72), Peavy sees counselling as a practical and holistic method of life planning. Also, Onnismaa (2007, p. 7) describes the fact that the target of counselling is to help the clients, or students in the educational context of our study, to live lives that are more balanced with their environment, act in a goal-directed way and utilize their own facilities.

Guidance and counselling do not mean the same thing as healing, but they mean that the student and the counsellor, working together, interpret and clarify the questions that arise when the student makes plans for his or her life and career. Guidance and counselling do not mean teaching or advising either. The role of the counselor is often debated. The counselor should avoid giving ready-made advice or recommendations to the student (Onnismaa, 2003, 8–9).

In Finland, personal study plans (PSPs) have been widely introduced in higher education institutions (HEIs) as tool to help engage students in the completion of their studies as planned and thereby enhance study progress and, at best, be seen as a valuable addition to a student's career planning. The majority of universities of applied sciences (UAS) have also introduced electronic PSPs (ePSPs) as a system of recognizing prior learning. Group instructors or tutors carry out annual development and guidance discussions with students, during which the ePSPs are completed, taking into account a student's career plan, personal life situation, professional growth, and development of identity and competences. When correctly employed, the PSP supports the students in the completion of their degree within a targeted time frame (FINHEEC, 2012, pp. 79–80).

Several definitions of ePortfolio exist, depending on context and use. In education, the ePortfolio is defined as a digitized collection of a student's work and reflections, which may include websites, an electronic learning environment, and recorded media. The advantages of the ePortfolio

compared to a paper-based portfolio are that they are easier to revise and combine with other materials, are portable (i.e., accessible in a variety of locations and devices), and can be shared with others. Furthermore, ePortfolio can pertain to a personal development plan (PDP) and support lifelong learning (Stefani, Mason, & Pegler, 2007, pp. 17–19).

There are different types of ePortfolios that are based on functionality: an assessment portfolio is used to evaluate student performance and achievements; a showcase portfolio shows learner competencies and work (e.g., to potential employers); the major role of a development portfolio is to support a student's personal development plan (PDP); the reflective portfolio is used for a learner's self-assessment, evaluation, and reflections (Stefani et al. 2007, pp. 41–43). In some contexts, like in our project, a process portfolio is used as a combination of the development and reflective portfolios. According to Klenowski, Askew and Carnel (2006, p. 268), key learning and teaching concepts when using portfolios for learning are: Co-constructivist learning, experiential learning, dialogic learning, reflective thinking, self-evaluation, meta-learning, and meta-cognitive skills.

ePortfolios are, on one level, another tool in the armory of e-learning, i.e., the use of ICT in learning. The pedagogy of ePortfolio use, as well as the effective use of e-learning, draws on theories of constructivism (Stefani et al., 2007, p. 57). Constructivism sees learning as a building activity in which individuals build an understanding of events, concepts, and processes based on their personal experiences, often supported by interactions with others (Pritchard, 2007, p. 2). The ePortfolio can be helpful in recording authentic learning by allowing students to compile various kinds of evidence of their learning, e.g., text, audio, video clips, and photos. ePortfolios stress the issues of lifelong and personalized learning, as well as student-centered flexible learning. Successful uses of ePortfolios underline the key role of reflection, which should be a continuous process throughout the study period. An ePortfolio with structured reflective processes and mentoring by the teacher will encourage students' self-aware, self-critical, and personal development. ePortfolios address the new forms of assessment. The advantage of an ePortfolio is that the self-assessment can be integrated directly with the student work. It also supports approaches to peer assessment (Stefani et al., 2007.) Two variables that affect the students'

positive attitude towards ePortfolio is that it allows social learning and gives students the feeling that they have control over their own portfolios (Garrett, 2011, pp. 197-201).

The previous studies about the use of portfolios show that it may cause anxiety among students if there is no single method or structure for writing the portfolios. It is necessary to explicit to the students the approach to learning on which the portfolio work is based. Students' willingness to be open and trusting and to expose their strengths and areas for development to the tutors and peer-students is important (Klenowski et al., 2006, pp. 277-281). The key issue when using ePortfolios in learning is that the students have the skills needed to use computers (Hughes, 2010, p. 203; Chen, Chang, Chen, Huang, & Chen, 2012, p. 123). If the technology is not user-friendly, the use of a developmental or reflective portfolio is fundamentally affected (Stefani et al., 2007, p. 107; Garrett, 2011, p. 201). The tutor's role must shift from theoretician to facilitator. It is important that tutors and students have respect for each other, and therefore, the issues of confidentiality and ethics should be discussed (Klenowski et al., 2006, pp. 281-283.)

Entre-Pofo is based on a type of portfolio that is used primarily as a device for learners to show their skills and competences in various ways, reflect upon their development and learning process, and establish new learning plans. For teachers and tutors, it is a tool via which to provide feedback to the students about their development. Entre-Pofo also helps students to discuss their ideas and plans with their peer students. A portfolio that is truly a story of learning is owned by the learner, structured by the learner, and told in the learner's own voice - literally and rhetorically (Barret & Carney, 2005).

Framework for the study

The development of the Entre-Pofo model and this paper were guided by the holistic counselling model (Figure 1). The holistic counselling model was created in the “Get a life” project, which was coordinated by Finland Futures Research Centre. The project also provided a practical future-oriented simulation tool for the students (Römer-Paakkanen 2011).

The holistic counselling model lies on constructivism and on Peavy’s (2000) socio-dynamic counselling, which is a general method for life planning and facilitates learning through the use of cultural tools and co-construction. We also implement Brousseau’s (Brousseau, Driver, Eneroth and Larsson 1996) pluralistic career theory.

Constructivism views a person as an open system, constantly interacting with an environment, seeking stability through ongoing change. The emphasis is on the process, not on an outcome; there is no completion of a stage and arrival at the next stage, as in stage-based views of human development. (Patton and McMahon 2006, p. 4.) The constructivist paradigm is appropriate in entrepreneurship education (Löbner 2006, p. 25) as well as when constructing an ePortfolio platform for higher education students (Le 2012, p. 64; Ke & Wu 2010, p. 1355).

Brousseau’s pluralistic career concept framework has four career concepts: linear career, expert career, spiral career and transitory career. A pluralistic definitional framework specifies explicitly that there are many ways to define career success. (Brousseau et al. 1996). Hall and Goodale (1986) indicate the stages in career development as a line of different periods of life, which they name exploration, trial, establishment, maintenance (growth, stagnation) and decline. According to Savickas, Nota, Rossier, Dauwalder, Duarte, Guichard, Soresi, Van Esbroeck, and van Vianen (2009, p. 2), career development theories and techniques have faced a crisis because their fundamental assumption of predictability based on stability and stages is debatable, and therefore, they may no longer be functional. Indeed, human behavior is not only a function of the person but also of the environment. They point out that even if the individual’s characteristics were stable, the environment is still rapidly changing. There-

fore, theoretical models that emphasize human flexibility, adaptability, and life-long learning are required.

Takanen-Körperich (2008, pp.155-156) constructed Brousseau's pluralistic career concepts by adding two alternative career concepts that she calls "parallel career concept" and "explorative career concept". In the parallel career concept a person can at the same time be active in several fields and in the explorative career a person has by change found a quite different kind of working life and environment than the educational studies would indicate. Both the parallel career and explorative career should be introduced to university students as new opportunities – actually many students already follow the parallel career as they study and work at the same time.

All life experiences are learning experiences because our work lives, our family lives, and our community lives are punctuated with incidences of informal and unplanned learning (Merriam, 2001, p. 94). The holistic counselling model takes into account that life has several dimensions that are intertwined: an education path (study counselling), a work and career path (career counselling and entrepreneurship counselling), and one's own life (family, hobbies, and experiences). Collectively, these dimensions develop student's competencies and skills. Work, education, and life paths should be reflected in a person's future environment and not only in the current moment or in those few years spent getting an education. The target of the holistic counselling model is to help higher education students realize that they themselves can influence their future, in fact, they can make their future. According to Godet (2001, 9), "future remains to be created and it is plural, undetermined and open to a wide variety of possibilities".

The model presented in Figure 1 indicates that by learning, developing, doing, challenging, reflecting, and planning, students can build their future so that they have a meaningful career path and can make their own choices. The active process of planning one's future also elevates the entrepreneurial spirit. By following the idea of holistic counselling model students can be pro-active and plan their future. They can also reflect on different study, career, and life path choices within possible future scenarios.

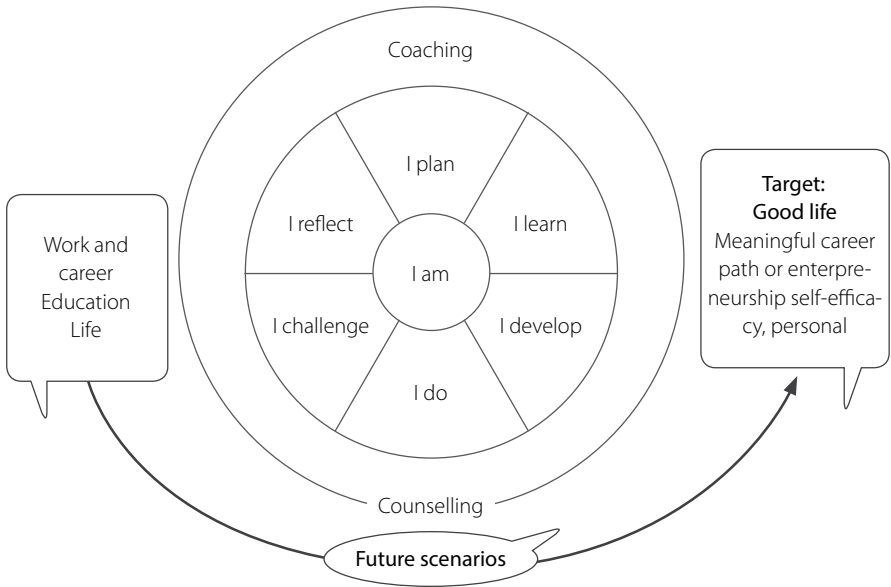


Figure 1. Holistic counselling model (Römer-Paakkanen, 2011).

The holistic counselling model presented in Figure 1 is also based on the principles of entrepreneurial learning. Entrepreneurial learning requires student-centered learning methods, in which the role of a teacher is to support the student’s learning and development of entrepreneurial behavior, skills, and attitudes. In general, learning and teaching entrepreneurship require changes in the roles played by teachers and students in learning processes (e.g., Jones & Iredale, 2010, p. 13; Kickul and Fayolle, 2007; Kyrö, 2005; Gorman, Hanlon, & King, 1997). Hence, a move from a teacher-centred learning approach toward student-centred learning is needed. While, in the traditional approach, the emphasis is on the scope and nature of the content learned, in student- or learner-centred learning, the emphasis is both on the content and on the nature of the learner’s process of learning (Carrier, 2007, p. 155; Davidovitch, 2013, p. 331). Knowledge is not transmitted to students, but this type of learning is often skill-related and aims at personal development (Carrier, 2007, p. 155). The role of a teacher is to facilitate students’ learning through guiding students’ understanding during the learning process (Kickul & Fayolle,

2007, pp. 2-7). In higher education, the lecture format should be renewed and the focus should be on strategies that empower students to take charge of their own learning. The use of engaging, interactive activities will allow students to take active roles in the educational process (Hsu & Malkin, 2011, p. 48). In entrepreneurship education, a shift from teacher-centred to student-centred learning does not mean that business theories or models become obsolete. Rather, they are applied when students learn by doing. Knowledge is not seen as an objective substance owned and transferred by a teacher to students. It is created in students' active social processes in action. Hence, knowledge is contextual and subjective (Kyrö, 2005; Kirby, 2007). According to Suonpää (2013, p. 136), the entrepreneurial learning process can be described as holistic, collaborative, and dynamic, rather than cognitive, individual, and static. We implement the social constructivist learning theory, which according to Suonpää (2013, p. 44), is a student-centred learning approach involving both individual and social aspects of learning. It assumes that students learn when they socially construct knowledge in interaction with other students within the context of its use. The role of the teacher is to create a learning environment that supports students' learning and personal development. Students take responsibility for their learning and others' learning, and they define what they learn and how they learn it. Hence, in this approach, students are capable of developing their entrepreneurial behaviours, skills, and attitudes. Kirby (2007, pp. 26–27) suggests that the learning approach implemented in entrepreneurship education should ensure the following:

- students have ownership of their learning,
- students are involved in problem solving in real-world situations,
- students are encouraged to formulate decisions on data that are immediate, incomplete, dubious, and personally generated, and
- students are provided with role models who are involved in both the learning and assessment processes.

Savickas et al. (2009) identified five shifts in thinking as being necessary to develop a new paradigm for life designing and building: from traits and states to context, from perception to process, from linear to non-linear dynamics, from scientific fact to narrative realities, and from describing to modelling. These same shifts in thinking are needed when

enhancing students' entrepreneurial learning and their growth toward entrepreneurship. Wing and Man (2007, p. 317) suggest that entrepreneurial learning is more than possessing an awareness of learning opportunities, a willingness to learn, or an accumulation of required experience, skills, and knowledge. Rather, a competent entrepreneur shall be selective and purposeful in learning, will learn continuously and in an in-depth manner, and will actively seek learning opportunities. Wing and Man underline that entrepreneurs need to transfer what has been learnt from direct and indirect experience, as well as the experience of others into current use, and will reflect upon the experiences, seeking more in-depth meaning and reasons for events.

Methodology

In our teacher and researcher group, we had both practical and research experience in entrepreneurship and entrepreneurship education, study and career counselling, and e-learning from different projects and different points of view. To generate ideas for developing and constructing the Entre-Pofo model for the professional development of students and for training them in entrepreneurship, we implemented the action research (AR) methodology and adopted the constructive research approach (CRA).

According to Mertler (2012, p. 14), numerous authors and researchers have proposed models for the AR process. Because this process is somewhat dynamic, models can look different from one another but will possess numerous common elements. AR models begin with a central problem or topic. They involve some observation or monitoring of current practice, followed by the collection and synthesis of information and data. Many AR processes follow similar steps that include planning, acting, evaluating, and reflecting. One example of this process can be found in Bachman (2001), where he presents a spiral that suggests participants gather information, plan actions, observe and evaluate those actions, and then reflect and plan for a new cycle of the spiral based on the insights gained in the previous cycle. AR is a recursive, cyclical process that typically does not

proceed in a linear fashion. The spiral nature of AR was first presented by Blaxter, Hughes and Tight (1996, p. 10).

According to Kuula (1999), AR aims to change common practices and solve different kinds of problems. AR involves and activates actors, requiring participation in the research. The researcher also participates in the process and is part of the everyday action of the organization. The researchers bring their own experiences from previous research projects, practices found in other research, and best practice.

We also follow the CRA proposed by Kasanen, Lukka, and Siitonen (1993) as a specific opportunity for management accounting researchers to engage in problem solutions that are relevant to managers (Labro & Tuomela, 2003). CRA is a problem solving process through which new constructions are created. The new construction of a model, plan, or other procedure can provide a more functional solution to managers in an organization (Kasanen et al., 1993, p. 224). CRA involves seven steps (Kasanen et al., 1993; Lukka, 2000), which we implemented (Table 1). The CRA process seems to be quite linear, but in practice the steps do not follow each other in a chronological way, but move forward, more like an action research spiral. In our application, the actors (i.e., researchers and developers as members of the target organization, the students in our case, as the users of the constructed innovation) work together collectively during the entire process. The problem area and the creative process emerge continuously during the construction process.

We started this development project as we realized through our work that there was a need for a tool to support the personal development of students and their growth in entrepreneurship. The project group consists of three teacher-researchers. In workshops (spring 2012) with the students we determined the level of our understanding about the issue (i.e. ePortfolio and especially Entre-Pofo).

We presented the Kyvyt.fi ePortfolio service and the idea of Entre-Pofo to entrepreneurial student groups (a total of 25 students). Nine entrepreneurship students that took part in the courses began to develop and test the Entre-Pofo model with our project group. As the students did not have prior experience with the ePortfolio platform or a working portfolio, they were given some training and time to become familiar with them. We

Table 1. The CRA Process That Was Implemented in This Research (modified from Kasanen et al., 1993 and Lukka, 2000)

Step	Stages in CRA	Stages in this research
1	Find a practically relevant research problem that also has potential for theoretical contribution.	There was a need for practical tools to help students plan and reflect on their professional development and growth in entrepreneurship.
2	Examine the potential for long-term research co-operation with the target organization(s). Both primary parties should be committed to putting significant effort into the project.	Both entrepreneurship teachers and students at our university of applied sciences are committed to the development project.
3	Obtain deep understanding of the topic area both practically and theoretically.	The researchers had deep pre-understanding of the topic, both from their practical work and from prior research. To gain an understanding of the students' point of view, workshops with the students were arranged.
4	Innovate a solution idea and develop a problem solving construction that also has potential for theoretical contribution. Conceptualizing the problem area so that useful communication between the parties can take place.	Constructing the existing ePortfolio service for the Entre-Pofo model in workshops with the research team and students.
5	Implement the solution and test how it works. This is the first level practical test (market test) of the designed construction.	Focus-groups and personal interviews for entrepreneurship teachers and students, inquiry for students.
6	Ponder the scope of applicability of the solution.	The piloting partners and test groups are under research.
7	Identify and analyze the theoretical contribution.	After piloting and testing also the theoretical contribution is evaluated.

stressed to the students that a portfolio is not only a record of their study output, but that reflection and self-reflection on their learning process over time was actually more important. As there are many potential ways to build the ePortfolio, it was emphasized to the students that they should create their own personal Entre-Pofo model to illustrate their personality and personal development process. Some ePortfolio examples were included in the Entre-Pofo model sites to provide students with examples of the many possible ways that their own portfolio could be structured.

To study how our solution (i.e., the Entre-Pofo model) works, we conducted focus group and personal interviews and e-mail inquiry for the students. Also a couple of feedback workshops were arranged. The students discussed their experiences, and provided feedback and tips for further development of the Entre-Pofo model.

We will continue this constructive research process by examining and further developing the Entre-Pofo model with several groups of entrepreneurship students. Other universities of applied sciences are also interested to pilot the Entre-Pofo model.

Results of the Project

In this section we first describe the crucial elements of the Entre-Pofo model and how we set up the Entre-Pofo sites into the Kyvyt.fi ePortfolio service (research task number 1). Afterwards, we present the experiences and comments obtained so far from the teachers and students involved in the construction work (research task number 2).

The Crucial Elements of the Entre-Pofo Model and the First Entre-Pofo Model

The portfolio learning environment needs to be sufficiently prepared. A clear view on portfolio learning lines is crucial for enhancing the intended outcome in the use of portfolio. (Poortinga & Meeder, 2007). On the Kyvyt.fi ePortfolio sites we present the project and principles of the Entre-Pofo process. There are also descriptions of Entre-Pofo elements, the ultimate aims of the portfolio, and some practical information about the types of documents students should add to their Entre-Pofo and how they should reflect on their learning and professional development.

Entre-Pofo in a nutshell is used by students interested in entrepreneurship or who want to become entrepreneurs to upload different study documents and completed assignments. These documents form a portfolio that demonstrates their knowledge, skills and competencies through their entrepreneurial growth. Entre-Pofo may contain entrepreneurship study plans, drafts, reports, diaries and blogs, final products, and reflections. In addition to written documents, users can include photos and videos in their Entre-Pofo. In Kyvyt.fi, there is the template for their curriculum vitae and Euro pass, in which students can describe their education histories, work experiences, knowledge, and skills. Students can create and utilize various portfolios for many purposes. Figure 2 presents the key elements of the first version of the Entre-Pofo model, which is based on the holistic counselling model described above. The students reflect and plan their entrepreneurial growth through five life dimensions or paths (working life and entrepreneurship; education; family and life path). By considering

one's own background, skills, competencies, etc. (i.e. being), by planning, learning, developing, doing or acting, and challenging the students can reflect and contribute to their professional and entrepreneurial development.

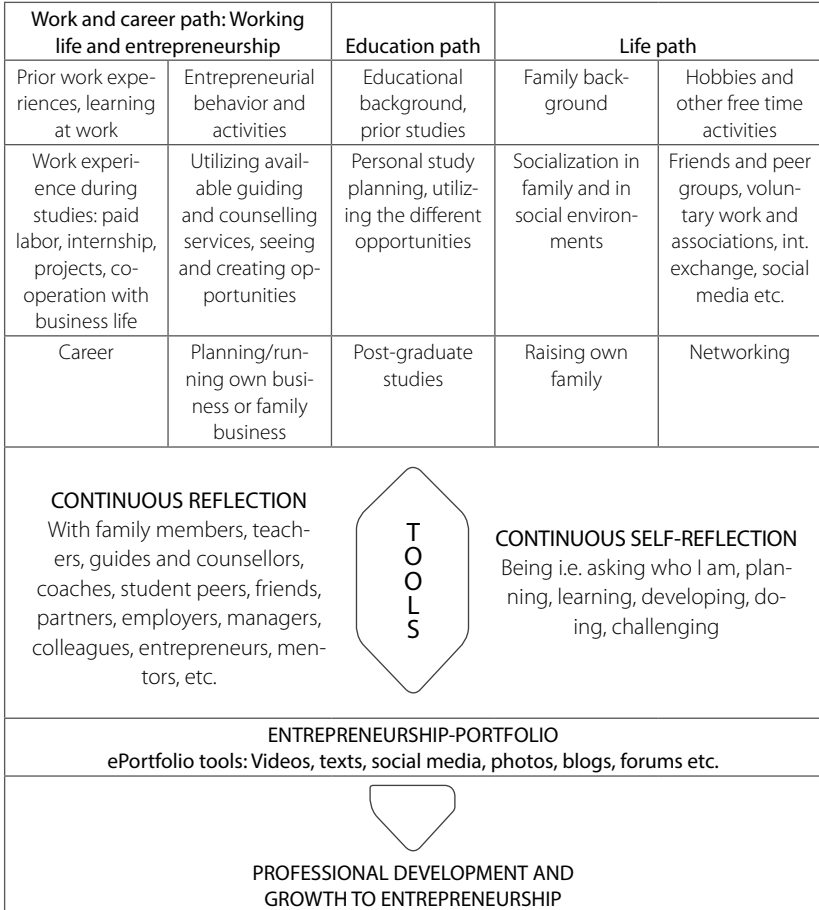


Figure 2. Key elements and the first version of Entre-Pofo model.

The constructed Entre-Pofo model includes self-reflection tools for students. Blogs are useful tools in a student's reflection process. In blogs, students can record entries in the form of a learning diary during their courses

or during their practical training periods. Students are also encouraged to continuously reflect on their entrepreneurial growing process in their blogs.

In order to enhance the students' reflection progress students should be given clear requirements for their reflection tasks (Poortinga & Meeder, 2007). In our project the students are asked to carry out continuous self-reflection mentioned in Figure 2 by being, planning, learning, developing, doing, and challenging. The dimensions are described in detail in the Table 2.

Table 2. Description of the Continuous Self-Reflection Dimensions in the Entre-Pofo-Model in Figure 2.

<p>Being: This dimension consists of students' own stories, background, and entrepreneurial efforts. They are invited to ask themselves the following questions: Who am I? What is my background? What are my objectives regarding entrepreneurship? What kind of entrepreneurial experiences do I have? What kind of success, failure, and try again experiences have I had? Students are also asked to describe possible business ideas or their family business background.</p>
<p>Planning: This dimension follows up on the personal development plan (PDP) for entrepreneurship. Also, potential business ideas are described in this dimension. The PDP consists of learning and educational background, work experiences, and experiences in other life areas, like hobbies and free time activities. In this section, students are also asked to describe their entrepreneurial learning experiences.</p>
<p>Learning: In this dimension students illustrate their entrepreneurship studies, other study choices, and plans concerning their entrepreneurial growth. One key element is how the students combine their entrepreneurial learning with other studies they undertake. They are also encouraged to reflect on their entrepreneurial learning in different contexts: at work, within their family, in their hobbies, and with their friends and peer groups.</p>
<p>Developing: Development in this context means the personal SWOT-analysis relating to entrepreneurship, professional development, and entrepreneurial identity. The main idea is to reflect on crucial factors that inspire their own entrepreneurial spirit or that may inhibit their entrepreneurial spirit.</p>
<p>Doing/Acting: In this part of the Entre-Pofo model process, students narrate their entrepreneurial path from the very first plan to the action. They portray and reflect on the concrete actions, e.g., the actions that promote entrepreneurship in their studies and in their everyday life.</p>
<p>Challenging: Here students self-reflect about those things that help them cope with challenging situations and help them solve problems. They also contemplate the meaning of risk and risk taking.</p>

Student self-reflection is a very important element of the Entre-Pofo process. Moreover, we consider that continuous reflection with other actors is significant and it supports student growth towards entrepreneurship—they can reflect with teachers, counsellors, student peers, coaches, family members, and with other entrepreneurs. These actors catalyze and facilitate the reflection process for the student by promoting self-assessment, e.g., by asking students what they have learned and what they think they should still learn in the future. The important task these actors have is to inspire students to collaborate.

Besides continuous self-reflection, receiving feedback and the opportunity to reflect with others are also important. Conversation with other course-participants encourages co-construction, developing new ideas and new understanding of students' own learning (Klenowski et al. 2006). Teachers, academic counsellors, entrepreneurship coaches, and other actors can provide feedback and guide students through the process and through reflection within Entre-Pofo in Kyvyt.fi. The aim is to coach and motivate students as they progress on their entrepreneurial path. It is also important that students receive answers to their questions and discuss their problems with teachers and with student peers. Neither the teacher nor student peers, nor anyone else has access to the student's Entre-Pofo portfolio unless the student makes their portfolio visible.

Interaction with other learners and actors is important in entrepreneurial learning. Hence, one of the advantages that Kyvyt.fi offers is the opportunity to network with other entrepreneurial students and actors. Any user can create a group at Kyvyt.fi and can decide whom to invite as members of that group. Networks can be built for various purposes, e.g., for study groups or other interest groups. In a group, students can chat, participate in a discussion forum, or write a wiki together. They can also share different documents with each other. In our project an Entre-Pofo group was created for students from different entrepreneurship courses. Through this group we had the opportunity to communicate with our entrepreneurship students. In the future our aim is to also invite entrepreneurs and other actors, such as mentors, to this group.

The First Comments and Experiences From the Students and the Teachers

This is an ongoing project and for the time being, only the first version of the pedagogical Entre-Pofo model has been constructed together with the students during their entrepreneurship courses. The construction work is continuing, but in this paper we can present some early comments and experiences provided by students and teachers who took part in the construction work of the Entre-Pofo model and who have used the Kyvyt.fi ePortfolio tool as part of the model.

One important point in AR is that the method recognizes that those people who take part in the research or project have the knowledge and ability to understand the phenomena and issues faced (Brydon-Miller, Greenwood, & Maguire, 2001). In two workshops (4 teachers and 9 students), and a student survey we asked the project actors to describe their experiences and provide comments and development ideas after testing the first version of Entre-Pofo during spring 2013.

We were particularly interested in the following themes:

- What were the advantages of using the Entre-Pofo model?
- What were the disadvantages of using the Entre-Pofo model?
- What was the general experience and motivation for using Entre-Pofo at Kyvyt.fi?

As the target group was restricted, we analyzed the data gathered from the workshops, personal discussions, and inquiry only by grouping the data loosely according to the themes mentioned above. At this point in the process, we do not need any statistical data, but we do need opinions, experiences from the practical use of the Entre-Pofo model, and the tools and ideas for further development of the model.

Students and teachers found many advantages in using Kyvyt.fi. According to the students, one important advantage in using Kyvyt.fi is that all study documents are saved in the same place. This feature supported student self-reflection, as they were able to return to their earlier documents and reflections whenever needed. The Entre-Pofo model makes the learning and development process more visible and students can examine their learning process more thoroughly. Students also have access to their

portfolio after they graduate, so it can be lifelong tool they can maintain. As one student stated: "...In future I can find my entrepreneurial thoughts from my Entre-Pofo and I have possibility to return to them also after graduation."

For teachers and counsellors Kyvyt.fi is a convenient channel for communicating with students about their products and processes. The teachers and coaches can also exploit the Entre-Pofo-model when evaluating student competencies and skills. As Kyvyt.fi enables versatile documentation, the evaluation is not only based on written documents, but by other means as well, since the students are able to express themselves using various creative means. Teachers and counsellors are also able to review student learning processes over a longer period. The role of the teacher becomes more of a moderator. Students feel that it is an appropriate tool through which to receive feedback from teachers, counsellors, coaches, and student peers.

In learning management systems like Moodle, the teacher usually only administers the course. From the student's point of view, a redeeming feature of Kyvyt.fi is that each user administers their own portfolio. The Entre-Pofo model is a student's personal learning environment. It is a process portfolio and a tool for planning and reflecting on their professional development process and lifelong growth in entrepreneurship.

Although our students were concerned about the privacy of their Entre-Pofo, they recognize that Kyvyt.fi provides them with new opportunities to network with other students and actors. One student stated that: "In my Entre-Pofo I can give someone the reading rights to some of my documents. I have also possibility to network with others." According to another student: "I can present my works to others and network."

One advantage of Kyvyt.fi from a student's point of view is that they can provide a coded link to their Kyvyt.fi portfolio to potential employers when applying for a job. When discussing the disadvantages, one question about security of the system came up. In part because students are asked to reflect on some very personal questions in their Entre-Pofo, they were very concerned about whether anyone else could see their portfolio. We emphasized that no one could see their portfolio unless the student provided access to it.

When using information and communication technology in teaching and learning, it is important that the technology be easy to use and that students are taught to use them. It is also essential that students are given reasons why certain technology is being used. Some of our students learned to use Kyvyt.fi very quickly, but others felt the platform was too complicated and not easy to use. Here are some comments from the students:

“The platform could be simpler. You have to click many times in order to get your Entre-Pofo updated.”

“The simple structure would help to learn the use of the platform. More features could be added later on if needed.”

“Additionally, the teachers and counsellors needed time to become familiar with the ePortfolio platform and with Entre-Pofo. Our team has an eLearning expert available to help teachers, counsellors, and students when they are learning to use Kyvyt.fi and when creating their Entre-Pofo. That kind of support was assessed as very valuable.”

“It was very good that we got guidance at the beginning of the portfolio process. It would have been impossible to do anything alone.”

As students already use many different web tools in their studies and in their free time activities, they were not as motivated to learn and adopt a new tool. One respondent commented that: “Social media is already full. I do not have motivation to take into use a new web tool again.”

Therefore, effort was made to motivate the students to use Kyvyt.fi and Entre-Pofo. We held discussions with the students to determine how they could implement Entre-Pofo and how they could easily link it to other social media tools like Facebook, LinkedIn and Twitter, which students were already used to using. After having used Kyvyt.fi for some time, the students now feel that Kyvyt.fi has a wide variety of tools that can be used for demonstrating their competencies and skills.

In our guiding and teaching work, it was our experience that students are not familiar with reflective thinking and self-reflection. Our recommendation is that they should receive more training and briefing on how to reflect on their learning and entrepreneurship progress. Students do not

necessarily understand the potential and value of ePortfolio. Therefore, it is important to spend some time at the beginning of a student's portfolio process to familiarize them with the concept. One student promised that: "I will take Entre-Pofo into use as soon as I understand the possibilities of ePortfolio."

When summing up the experiences of the project so far and based on the first user experiences, we can conclude that Entre-Pofo is worth further development and that it will help entrepreneurship learning over the long run. It also helps teachers and counselors to follow and encourage many students in their very personal processes.

Conclusions and Recommendations

The two main goals of this paper were to outline the crucial elements in constructing the Entre-Pofo model and to collect students' and teachers' first comments on and experiences with using the Entre-Pofo. The most important contribution of this paper is the first version of the student-centered Entre-Pofo model, which can be used in entrepreneurship education and coaching in higher education.

Entre-Pofo may contain various study documents and completed assignments, i.e., entrepreneurship study plans, drafts, reports, diaries and blogs, final products, and reflections. In addition to written documents, students can include photos and videos in their Entre-Pofo. They can reflect on and plan their entrepreneurial growth through five life dimensions or paths (working life, entrepreneurship, education, family, and life path). The holistic perspective on the students' various life dimensions originates from the holistic counselling model developed in previous research and development projects. The Entre-Pofo model also follows the thinking of Savickas et al.'s (2009) life-design intervention model, which endorses five presuppositions about people and their work lives: contextual possibilities, dynamic processes, non-linear progression, multiple perspectives, and personal patterns.

The Entre-Pofo model includes self-reflection tools, and students are encouraged to continually reflect with other actors, such as teachers, counsellors, student peers, coaches, family members, and other entrepreneurs. Even though students are often self-directed when working with their Entre-Pofo, active engagement in dialogue and collaboration with the counsellor or teacher and other course-participants followed by reflection on these processes is important. Also, the previous literature underlines the importance of reflection with other actors. Students have not necessarily needed self-reflections skills, and therefore, they should be coached in these skills.

The results of our empirical study are still preliminary because the Entre-Pofo has only been tested with a very limited amount of students. On the basis of focus-groups and personal interviews for entrepreneurship teachers and students, as well as inquiries directed at students, we can already conclude that the Entre-Pofo model and the ePortfolio in general are practical tools for supporting students' growth toward entrepreneurship and also their personal and professional development. In our research, the same opinions and developmental needs arose as in previous research and literature regarding the use of e-portfolios. ePortfolio tools should be easy to use, and it is important to explain to the students how and why to use ePortfolio. Networking and reflecting with other students and actors are also very important. If ePortfolio does not meet students' learning needs or if learners perceive that they can gain the necessary knowledge in another way, then the use of ePortfolio fails. Future methods of entrepreneurship counselling and coaching should take a dynamic approach that encourages individuals' imaginative thinking and creativity.

We recommend that ePortfolio tools are introduced to students when they commence their studies because these tools support the idea of lifelong learning and counselling. Students should be trained to use the ePortfolio platform in many ways. At the beginning of the portfolio process, ePortfolio tools should be as simple as possible. Once students have learned to use the tool, more functions can be adopted. Students should also realize the importance of peer group reflection and therefore provide their peers with access to their ePortfolios.

According to our students, teachers and counsellors have an important role in enhancing the use of Entre-Pofo, but teachers and counsellors

should not teach or lecture. Rather, they should act more like facilitators. According to Klenowski et al. (2006, p. 208), this requires a shift from a receptive-transmission model, in which the teacher is an expert in a particular field and provides information to a passive recipient, to a constructivist and co-constructivist approach. Key learning and teaching concepts when using portfolios for learning are as follows: co-constructivist learning, experiential learning, dialogic learning, reflective thinking, self-evaluation, meta-learning, and meta-cognitive skills.

Entre-Pofo model is not bound to business studies, but it can be applied in any other field of study to support the personal and professional development of students. Entre-Pofo can also be introduced in teacher and counselor education as a tool that facilitates following a student's professional development process, especially in entrepreneurship education and entrepreneurial learning. For teacher and counsellor students, the most illustrative way to become familiar with ePortfolio is to use it in their own studies. Reflective thinking and self-reflection are key elements in the portfolio process, and they can be practiced during teacher and counselor education. Also, in teacher education, it should be stressed that entrepreneurship education includes the process of enhancing entrepreneurial behavior and entrepreneurial learning, not just the creation of a new venture.

So far, the focus of our project and research has been on constructing the first version of the Entre-Pofo model. The process has been very interesting, challenging, and empowering because the students have also been involved in the development work. We will continue this action research and develop the Entre-Pofo model and practical tools further. Our next step is to introduce Entre-Pofo to larger groups of students, teachers and counsellors so that we can obtain more information about how these tools work over a longer period. To do so, we should construct an adequate instruction manual and train new students and personnel. We also plan to collaborate with colleagues from other study programs within our own university and from other universities of applied sciences to ponder the scope of applicability of the solution. The piloting partners and test groups are under research. After piloting and testing, the theoretical contribution can also be evaluated.

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8 Affordance as a Key Aspect in the Creation of New Learning

Susanne Dau

Abstract

This research aims to highlight how different places and spaces in undergraduate teacher education afford student learning and the development of certain types of knowledge related. The questions this article addresses are:

- a) What is the affordance of different learning spaces in an undergraduate blended learning (BL) education?
- b) What are the actors' prerequisites and reported understanding of the driving forces behind their learning activities in these different spaces?

The analysis draws on a conceptual frame of complex affordance of spaces in a socio-cultural perspective, but also on spaces for both social and individual knowledge development. Through the analysis of empirical data gained from a pragmatic mixed-method approach, the role of different face-to-face and online spaces is investigated; investigations are based on the understandings of students, lecturers, and practitioners. The major findings regard the contribution of spaces to sociality, identity, and referential embodied experiences, which greatly influence student preferences and learning activity, as well as knowledge development. It is concluded that individually and socially constructed learning influence and are influenced by different learning spaces. A student's identity is a prerequisite to their interaction with spaces, but the borders, artefacts, and possibilities of the spaces also contribute to the student's development of identity. Development of identity cannot be separated from learning and student

interaction in learning spaces. A student's embodied interaction is found both in reference to experience and in the process of being developed towards a fictive future, which is a result of their preferences and engagement.

Keywords: Complex Affordance, Identity, Knowledge Development, Spaces, Places

Introduction

This research aims to examine how various spaces and places in blended learning (BL) afford student knowledge development from a user perspective. Exploring the perspective of use of space is paramount to understanding the possibilities and constraints of BL in undergraduate educational settings. This is of importance to policy makers, administrators, lecturers, and students. Practical problems of resistance arise when implementing different media as artefacts in education (Åkerlind & Trevitt, 1999; Holley, 2002; Laurillard, 2002; Holley & Oliver, 2010). Although much research has been conducted in the design and implementation of BL, little attention has been given to the culture and to the space- and place-related behavior prompted by spaces and places of such design and implementation (Crook, 2002). Problems arise that prompt the creation of new agendas by policymakers and administrators when implementing new models, e.g., BL. Because it is not always possible to implement these new agendas without considering the different culture and space possibilities and constraints in question, attention must be given to ways in which these models may be implemented in a culture-specific, complex context. I therefore claim that there is a need to investigate the articulation that different spaces offer at a concrete level. Because this article is based on research into the process of implementing BL in undergraduate teacher training at a university college in Denmark, the practice-oriented research question is as follows:

What is the affordance of different learning spaces in an undergraduate blended learning (BL) education, and what are the actors' prerequisites

and reported understanding of the driving forces behind their learning activities in these different spaces?

In this article I will briefly introduce Danish policy intentions and the European influence on the design of BL at University College North (UCN) in Denmark. This is followed by a description of the spaces of BL related to the field investigated and the derived theoretical questions. A theoretical frame concerning affordance and knowledge development related to space is described as the foundation of investigation into the questions raised. Next, the empirical research methodology is described. The findings are presented at two levels: 1) the prefigurative and configurative analyses, and 2) the refigurative interpretation from the derived findings of:

- Spaces of sociality and connectivity and the referential classroom
- Disruption space and space of the future
- Non-space

The findings are then briefly discussed, followed by the conclusion to both the empirical and theoretical questions investigated. The policy level and the described curriculum are strategic levels that influence the conditions that shape the praxis level of implementation. Therefore, I will briefly introduce some of the policies behind the increased focus on BL and ICT in teacher education in Denmark and Europe, as these are pushing towards a more flexible ICT-oriented type of teacher education.

Danish Educational Trends

Danish Policy Intention

In the last decade, teacher education in Denmark has been exposed to several reform events, the most recent of which focused on teacher competences. A new Nordic school and the intention to create a full time school to extend regular classroom hours have been highly debated in the media recently. A central aspect of these reforms is improved, extended use of information and communication technology (ICT) and the creation of a flexible frame for education and learning (The Government, Municipalities and the Danish Regions, 2013). The Danish Technology Council recommends that further attention be paid to applying ICT competences in teacher education as part of the pedagogical practice in different courses (Teknologirådet, 2011, p. 6). These recommendations and reforms concern new ways of using existing learning spaces and places and the activation of new spaces for educational activities in an attempt to fulfil the requested competences for lifelong learning and challenges in a globalized world. Although culture is mentioned as a central aspect, there seems to be no explicit consideration as to how to acknowledge culture and simultaneously renew it.

European Policy Influences on Blended Learning at UCN

Supported by the European Social Fund (ESF), the intentions behind more flexible education at UCN were implemented in four areas of bachelor education programs at UCN, including the teacher education program. The ESF supports the intention of the Lisbon Strategy to create “The most competitive and dynamic knowledge-based economy in the world of sustainable economic growth with more and better jobs and greater social cohesion” (European Union Parliament, 2010, I.5, p.1), which was extended by the plan for 2020 (European Commission, 2010). The implementation of models of BL is therefore a minor part of a larger strategy, not only in the development of Danish education programs, but also economic growth in Europe.

Spaces of Blended Learning

The investigated educational spaces are the educational stations, the student's home, the municipal schools during the periods of internship, and the classrooms at UCN. The educational stations are single technology-rich classrooms placed in rural areas, creating additional possibilities for students living there. These possibilities include access to videoconferences and a space for student's cooperation with peers from the area.

The strategic papers at UCN describe flexibility as BL. BL combines face-to-face classroom methods with computer mediated activities (Garrison & Vaughan, 2008; Graham, 2006) and is regarded as beneficial (Singh, 2003, p. 53). Students learn, at least partially, through online delivery of content and instruction, with some element of student control over time, place, path, and pace. Additionally, they learn at a supervised brick-and-mortar location away from home (Stake & Horn, 2012). The design of BL has been developed through lectures in teacher education at UCN. The designed model of BL in teacher education is progressive and subject to continuous development, as formative evaluation by lectures and students provides a continuous influence on the models. The model describes how courses should be blended (Christensen & Kristensen, 2012), but does not, as a strategic paper, provide any description of the impact of assumptions and attitudes. Although research has investigated attitudes towards implementing ICT as a key element (Lawton & Gerschner, 1982) and the connection between attitudes and implementation of ICT (Marshall & Cox, 2008, Christensen 1997, 2002), limited research seems to have been conducted concerning the ways in which the presumptions, prerequisites and references of students and teachers interact with spaces. "Space is often a neglected aspect of learning" (Poutanen, Parviainen, & Åberg, 2011, p. 293). The significance of new learning spaces and places is not easily applicable in education, especially when the affordances of spaces and identity processes are neglected in the investigation of new BL environments.

In order to identify a clear link between the use of ICT and the extent of learning, however, much more sensitive measures and instruments are needed. Such tools need to reflect the interrelated affordances/

constraints in settings and the way in which they are manipulated relative to the students' prior abilities. (Kennewell, 2001, p.112).

As illustrated, the analysis of the practical problem calls for a more theoretical approach to investigating the question of space influence when implementing BL and extended use of ICT. I argue that the concept of affordance can be a relevant theoretical frame that makes a more adequate and precise contribution towards what is at stake when problems arise in implementing new spaces and places in education. At the same time, affordance is a theoretical concept that is interrelated with the concept of spaces, learning, and knowledge development in educational settings, especially complex affordance. This leads to a more theoretical research question:

How can affordance conceptualize the constraints and possibilities in different learning spaces related to processes of knowledge development?

A conceptual frame regarding affordance of spaces in learning and the concept of knowledge development are therefore the theoretical foundation of my analysis of the empirical data, which consequently results in an answer to the theoretical question. An introduction and argumentation of the selected theoretical frame follows.

The Theoretical Framework

The theoretical frame consists of interrelated and interdependent concepts of spaces, knowledge development and affordance. This interrelationship claim is based on an epistemological understanding of knowledge and cognition as situated. This includes idea that no activity, such as learning, identity development, or knowledge development, can be seen independently of the physical context, activities, culture, and language. The use of concepts and a theoretical approach in the interpretation of empirical data is, in this research, mainly founded on social constructivism. Learning is what is intended, and it is a process of knowledge development among individuals, communities (Illeris, 2013), and organizations (Nonaka & Konno, 1998). Knowledge development influences and is influenced by identity, and the processes of knowledge development are embedded in socially situated contexts (Illeris, 2011, 2012). Thus, the process of learning affects and interferes with the affordance of spaces. To illustrate this, a conceptual description of an affordance is presented in the following paragraph.

Affordance Related to Spaces

Affordance relates to processes, activities, surroundings, environment, artefacts, people, and the past, present, and future. Affordance is also the catalyst that shapes the conditions of learning and knowledge development spaces. Gibson introduced the concept of affordance: “The affordances of the environment are what it offers the animal. What it provides or furnishes, either for good or ill” (Gibson, 1979, p.127). Affordance points in two directions, to the environment and to those who observe these (Gibson, 1979, p. 129). A distinction can be made between simple affordance, as seen by Gibson, and a more complex type of affordance, as described by Turner (2005). For instance, Norman’s (1990) use of affordance diverges from Gibson’s conceptualization. Norman defines affordance as something that possesses both actual and perceived properties. He divides affordance into real, perceived, and intentional affordance (Norman, 1988). A further

extension of complex affordance unfolds in a more sequential breakdown of false affordance, correct rejection, hidden affordance, and visible affordance (Gaver, 1991). Affordance has been linked to the concept of mediating artefacts (Cole, 1996), but also to more expansive notions of boundary objects between users and designers (Bødker & Christiansen, 1997), and to boundary objects, both between and within the community of the practice of designers and users (Wenger, 1998). A more physical and embodied orientation of affordance is espoused by Stoffregen (2000), Heft (1989), and Dohn (2009). Dohn (2009) argues, in line with Heft, in favor of a Merleau-Ponty-inspired approach. Dohn describes knowledge as embodied and embedded. Affordance plays a role in the meaning of a situation. Dohn relates affordance to the use of ICT in learning and mentions that a web camera, for instance, can constitute part of the background situation. The use of a web camera affords a certain bodily behaviour and limitation (Dohn, 2009, pp. 162–163). Space is determined by the person's physiology and experience, knowledge, and skills required in the social-cultural context in which the person is involved (Dohn, 2009, p.164). Chemero (2003) includes a relational dimension to affordance and both he and Ingold (2000) propose a view of overcoming the dichotomy of subject-object relation. Ingold argues that, in addition to embodiment, enmindment also occurs when the body and mind are disseminated in the same way, and take part in the same process of activity in the environment (Ingold, 2000, pp. 170–171). Thus, affordance seems to be dependent on the context in which physical, mental, and conceptual arrangements exist. Affordance contains both general and individual predispositions in the use of artefacts. Familiarity with contexts and artefacts is described by Turner in relation to Heidegger's concept of the referential whole in humans (Turner, 2005). Affordance is therefore not independent of either disposition, of culture, or the use of objects associated with embodied tacit knowledge and nested routines (Dohn, 2009).

The holistic approach to the concept of affordance described by Ingold (2000) and Dohn (2009) and the relational approach described by Chemero (2003) seem to embrace the notion of a complex approach, which was also welcomed by Turner (2005). Although their contributions to the complexity take different points of departure (social anthropology,

phenomenology, and ecological psychology), they all contribute to a balanced and more extended complex view of the concept, which also forms the basis of the analyses referred to in this article. As claimed by Ingold, research must examine how people perceive, think, act, learn, and remember within the contexts in which they occur (Ingold, 2000, p. 171). This will be the focal point of this article. In addition, Dohn's (2009) recommendation to examine the question of what a learner does not do, contrary to our expectations, and why, will be taken into consideration in order to identify whether a student uses background affordance, or as Chemero describes it, the transactions, as a basis for non-action (Chemero, 2003). The concept of affordance does not directly unfold the specific meaning of learning and knowledge development as a matter of concern. However, because a main learning outcome in teacher education is students' knowledge development, as well as the achievement of competences for the knowledge development of the profession, I will describe the relationship below.

Knowledge Development Related to Spaces

Knowledge development coincides with the concept of learning and cannot be separated from the context in which it emerges (Illeris, 2011). Nonaka & Konno (1998) refer to the concept of *ba* as a space concept related to knowledge management and development. *Ba* exists at many levels and is a shared space, whether physical, virtual, and/or mental. *Ba* provides common ground for advancing individual and/or collective knowledge. Knowledge nests in *ba*; separated from *ba* it turns into information. Knowledge creation is a spiralling process of interaction between explicit and tacit knowledge that leads to the creation of new knowledge, as pointed out in socialization, externalization, combination, and internalization (SECI). The four types of *ba* correspond to the four stages of the SECI-spiral process: 1) originating *ba*, where people share feelings, experiences, and mental models; 2) interacting *ba*, where individuals share mental models, but also reflect on their own, e.g. through dialogue; 3) cyber *ba* is a place of interaction in a virtual world rather than in the real

world and time, and it represents the combination phase; and 4) exercising ba supports internalization, e.g. through training. The use of Nonaka and Konno's (1998) concept of ba and knowledge creation expand the concept of spaces and places, including the notion of their relationship with knowledge development and thereby learning. This is accomplished not only by individuals in their environments, but also by the idea that space is more than a psychical, psychological, and social environment with different affordance. Thus, activities are related and interrogated in ba in a more procedural flow. I will argue that the exact concept of ba as an analytic optic is essential to the revelation of the affordances of spaces in teacher education, as the demands for the professional education of teachers are concerned with student competences in the further and continuous development of their profession as described in the curriculum (*Studieordningen for læreruddannelsen*, 2012).

The above theoretical frame is the foundation for the interpretation and derived findings. The extended concept of complex affordances in this article offers a nuanced approach to the investigation of the possibilities and constraint of the spaces, as well as an answer to the empirical and theoretical research questions. Since knowledge development and spaces are key aspects in the field of education, the interpretation of complex affordance must necessarily be undertaken in light of this. The intertwining of the concepts from the analysis and interpretation of empirical data gives rise to a new cohesion at both practical and theoretical levels. In the next section I describe the empirical methodology.

Empirical Research Methodology

My investigations were based on a mixed method approach, as different data collection approaches seem to be the best way to grasp complex affordance. The design included a survey, focus group interviews, and observations among participants at a practice level, in an effort to reflect the level of complexity. The pragmatic mixed method was chosen because the combination of different approaches in design is fruitful (Hoshmand, 2003) when answering a research question. The mix contributed to discovering the express meaning (Dewey, 1948, 1920) of BL in teacher education.

Empirical data (Table 1) were collected from students during their first semester of a BL education. All students were requested to participate in the survey (N = 32), and 21 students completed the online survey after two rounds with online reminders. However, one explanation of the lack of full participation in the survey may be that the students were occupied with trying to adapt to a new learning environment. The topic in the survey included three main areas: students' prerequisites for participation in a BL education (for instance, their experiences with the use of Web 2.0 technologies), students' understanding of and preferences regarding learning, and finally, their use or plan of use of the educational stations.

The survey was pilot tested with four students prior to implementation. The focus group interviews were conducted among all (N = 4) lecturers in the first year of the blended education. The purpose was to gain knowledge of their experiences and perspectives on three main issues: blended learning, learning/knowledge development, and places/spaces. Eight students were selected as a representation of both genders and variation in residence after enrolment in the program. All four mentors were invited to participate in a focus group interview, two of whom participated. Internship supervisors were selected from one municipal school; all four supervisors of first-year students were invited, but only two participated due to illness and workload. Ethical issues regarding the focus group interviews were considered. Well-known locations were selected for the interviews to create comfort. All informants were aware of the purpose of the investigation, the obligation to secrecy, and the ability to withdraw at any time. In the interaction during the interview, it was ensured that all were equally heard. All interviews were fully transcribed.

Two observation studies were carried out at UCN; all students and the four lecturers voluntary participated in evaluation sessions. One additional observation study was conducted at the municipal school where the above-mentioned internship supervisors were employed and students participated during their first internship. The purpose of these observations was to supply other empirical data with more situated knowledge of everyday life at UCN and in the internship. Desktop studies were used to gain knowledge of online activities. For a more detailed overview of the data collection, see Table 1.

Table 1. The Mix of Data Collection Methods

Data Collection	Parti- cipients	Invited Parti- cipients	Number of Parti- cipients (n)	Time - Duration	Period	Place of Collec- tion – Context
Survey – question- naires using the Likert scale	Students at teacher blended education	All stu- dents enrolled in blended education (age 19 to 21years) (N = 32)	n = 21 66%	Time spent on question- naires estimated at 20 min in the pilot study	October 2013	On-line question- naires – SurveyEx- act
Focus group interview 1	Students first se- mester	Select students (N = 8)	n = 8 100%	1.5 hr	28.11.12	UCN – meeting room
Focus group interview 2	Lecturers at UCN blended education	All lectur- ers con- nected to the blended teacher education (N = 4)	n = 4 100%	1.5 hr	04.12.12	UCN – meeting room
Focus group interview 3	Supervi- sors at municipal school	Supervi- sors	n = 2 50%	30 min	04.03.13	Municipal school meeting room

8 Affordance as a Key Aspect in the Creation of New Learning

Data Collection	Partici- pants	Invited Partici- pants	Number of Partici- pants (n)	Time - Duration	Period	Place of Collec- tion – Context
Focus group interview 4	Mentors at local educational stations	All 4 mentors	N=2 50%	1 hr	28.01.13	UCN meeting room
Observation 1	Students and lecturers	All 4 lecturers and all students	100%	2 hr	26.10.12	UCN classroom
Observation 2	Students, lecturer, and supervisors	6 students, 1 lecturer, and 2 supervisors	100%	Two 1 hr sessions of tripartite talks and 1 hr of student lecture of sixth grade students	16.01.13	Municipal school, meeting room, teachers' room, classroom
Observation 3	Students and lecturers	All 4 lecturers and all students	100%	2 hr	12.04.13	UCN classroom
Desk top study	Students and lecturers	All students and lecturers using the learning management system; It's-Learning	100%	Continuously	01.09.12–01.05.13	Online

The concrete approach relied on primary sequential analysis in which the quantitative data from the survey were collected prior to the qualitative data. The qualitative data had a dominant status (Burke & Onwuegbuzie, 2004). The quantitative data were used as a foundation for the qualitative data, because the quantitative data derived from the survey primarily regarded student prerequisites of participating in blended teacher education.

The pragmatic design approach was followed by a pragmatic critical hermeneutic analysis and interpretation using the threefold mimesis as a process of mimesis 1 (prefiguration), mimesis 2 (configuration), and mimesis 3 (refiguration) (Ricoeur, 1984, pp.54–71). Ricoeur's hermeneutics addresses the interpretation of the emplotment and peculiar reordering of the action of humans in mimesis 2, which leads to an interpretative identity akin to specific time and space. Ricoeur draws causal connections between events of the past and excludes tenses of present and future (Ricoeur, 1985, p. 64). Thus, data are collected at specific in situ times in the students' BL process, which are listed in Table 1. However, the experiences expressed are retrieved from the informants' past and processed afterwards. The interpretation of the text is taken into another present space-time by adding configurative structures that point forward into the future via refigurative perspectives on the case studied.

The use of the mimetic interpretative hermeneutical approach contributes to a holistic and future-oriented interpretation. This is achieved by unfolding the experienced affordance of spaces and further through a distancing from prefiguration and emerged plots towards a more fictive refiguration, without neglecting space and time. However, it must be said that it is primarily the sequentially and structurally methodological grip on the levels of interpretations that is used here because a larger narrative and phenomenological approach is omitted. Table 2 illustrates the mimetic analytic and interpretative process:

Table 2. The Process of Analysis and Interpretation

Empirical Data	Prefiguration	Configuration	Refiguration
Survey	Pure data from survey	Tendency and areas of interest with statistically significant thematic analysis	Use of new naming and framing as a distancing from the prefigurative through the configurative towards the fictive future. A critical distancing where explanation, e.g. by theoretical interpretation, is added. It is an interpretation towards a more complex understanding. It is also a movement both backwards and forwards between the levels of prefiguration, configuration, and refiguration.
Focus group interviews	Pure data from emerged narratives – full transcript (103 pages single spaced font size 11)	Plots of interest derived from the pure data and linked to both the parts and the whole	
Observation studies	Pure data from field notes	Thematic areas of interest as a sort of plot	
Desk top studies	Background data as they emerge on the learning platform	Discussions and postings as elements of interest picked from the on-going correspondence-a selective approach	

Findings

A schematic overview (Table 3) of the analysis of data derived from focus-group interviews, students, and lecturers, is here divided into the processes of mimeses 1 and 2, followed by some interpretation at the mimesis 3 level. Because lectures and students are the main actors in the specific period investigated, only findings from these informants are included due to the article's scope.

Table 3. Analysis: Mimeses 1 and 2

In-form-ants	Spaces: Face-to-Face, Online, and Conceptual	Mimesis 1—Prefiguration	Mimesis 2—Derived Plots in Configuration
Lecturers	Face-to-face spaces as originating ba, interacting ba, and exercising ba	<p><i>"We have a design that builds on being present, then we experiment with something that's not" (p. 3)</i></p> <p><i>"There is a lot of apprenticeship in it ... it demands 'live' presence because facets would never appear if it wasn't done in physical presence" (p.4)</i></p> <p><i>"... Because it's about relations ..." (p.4)</i></p> <p><i>"... But commitment is there ... when you are in the same room, it's just more" (p.15)</i></p>	Spaces of sociality and connectivity and the referential classroom space
	On-line spaces as cyber ba	<p><i>"...they begin to get some tools to do it (teach) in different ways" (p. 8)</i></p> <p><i>"...that, they try it and get it transmitted to the municipal school" (p. 8)</i></p> <p><i>"It's a digital pencil case" (p. 9)</i></p> <p><i>"They are open towards that web2" (p. 14)</i></p> <p><i>"The video transmitted instruction... it becomes...like watching television... they are sitting and doing a lot of other stuff" (p. 31)</i></p>	A toolbox and a disruptions space
	Educational stations (no ba)	<p><i>"We don't need them ... what would they use them for? ... they all live in Aalborg" (p. 21)</i></p> <p><i>"Peace be with them" (p. 21)</i></p> <p><i>"Software and hardware, you must have it at home"(p. 20)</i></p> <p><i>It's out of touch with the concept of flexibility" (p. 23)</i></p>	The non-space
	Issues of identity as originating ba	<p><i>"We do many tasks, where they involve the self" (p. 19)</i></p> <p><i>"The education is a formation process" (p. 13)</i></p> <p><i>"It could be that you have to think yourself as a student ... an identity of being a student" (p. 22)</i></p> <p><i>"It's a process of sociality" (p. 25)</i></p>	Spaces of sociality and connectivity

In-formants	Spaces: Face-to-Face, Online, and Conceptual	Mimesis 1—Prefiguration	Mimesis 2—Derived Plots in Configuration
Students	Face-to-face spaces as originating ba and interacting ba	<p><i>"As a lecturer mentioned...what happens between the lectures is actually more important than what happens in lectures" (p. 27)</i></p> <p><i>"...to be present as a teacher... it's about being present in the classroom" (p. 12)</i></p> <p><i>"...here at UCN you really have to take responsibility" (p. 32)</i></p> <p><i>"I have chosen to be a teacher because I want to be present with the pupils" (p. 13)</i></p> <p><i>"To sit here, also socially... I learn more" (p. 29)</i></p>	Spaces of sociality and connectivity and the referential classroom space
	On-line spaces as cyber ba	<p><i>"... but in front of your computer (at home) there are a lot of other things that seem more important to you" (p. 32)</i></p> <p><i>"The interaction disappears, it's not real instruction" (p. 10)</i></p> <p><i>"You can't talk to him (lecturer), it doesn't work and you are disconnected" (p. 11)</i></p> <p><i>"It's the future (ICT) ... look of what the children do in their leisure time" (p. 42)</i></p> <p><i>"At UCN you are 100% focused, while at home you are only 10%" (p. 32)</i></p>	A disruptions space and a space of the future
	Educational stations (no ba)	<p><i>"We aren't introduced... we don't know much about it" (p. 33)</i></p>	The non-space
	Issues of identity and the sociality as originating ba	<p><i>"It's more social to meet" (p. 12)</i></p> <p><i>"I want to have a class that I can meet with, and get some social relations" (p. 33)</i></p>	Spaces of sociality and connectivity

At the mimesis 3 level, the theoretical concepts will extend the analysis, as the concepts of affordance, spaces, and knowledge development can add some explanatory elements to this level of refiguration. This is also where other empirical data from the survey and observation studies are included in the interpretative process of proximity and distancing.

Spaces of Sociality and Connectivity and the Referential Classroom Space

Face-to-face spaces, but also certain parts of virtual space, e.g., Skype, can have some related elements of sociality, although some scepticism exists. If learning cannot be separated from the context in which it takes place, as Illeris (2013) argues, then it becomes essential to consider how participants comprehend this. As one lecturer noted: “The distancing that occurs as soon as people are not in the same physical space, it does something to us” (lecturers, p. 14).

This quotation illustrates a perceived negative affordance of the on-line space compared to face-to-face spaces. The preference for face-to-face instruction emphasizes its affective influence. Moreover, students highlighted the meaning of sociality in face-to-face interaction: “It means a lot that social cohesion is present, this is where good academic learning can take place” (students, pp. 27–28).

This illustrates a strong relationship between an internal psychological process of acquisition and an external interaction process between the learner and the learner’s social environment, as Illeris (2013) also stresses. The connection between the students’ knowledge development and sociality is related to group work: “The social is ... important... yes, just when you connect with each other. This is best done when ‘sitting’ in a group” (students, pp. 27–28).

A preference for cooperation with peers is also significant in the survey (74%). The difference between sociality in face-to-face spaces and online spaces appears in the use of body language and the ability to read each other when face-to-face. “Firstly, I just think there are many things with body language ... there is a lot more face-to-face ... misunderstandings (on-line) when you ... cannot see how he reacts to it, like when you ‘read’ other people” (students, p. 9).

In this quotation, affordance is dependent on culture and the use of associated objects, as well as embodied tacit knowledge and nested routines (Dohn, 2009). It is a matter of how familiar people are with reading each other. Consequently, the referential whole discloses both embodiment

and enmindment. Like the lecturers, students question the online social learning space.

I really need the social part and I think it (online media) destroys that... but can social media not also limit the social? ... If I was not sitting ... you could go to a cafe instead ... there are some, who are more busy making status updates (on Facebook) than being with people (students, pp. 35–36).

Affordance offered can be either positive or negative (Gibson, 1996, p. 27), and in this quote the association seems to be negative. The design of BL and the included artefacts are therefore boundary objects (Wenger, 1998), both between and within the community of lecturers as designers and students as users. Here, the borders of social transaction are related to the online activities, or as Dohn (2009, pp. 162–163) describes it, a part of the background situation, where the online activities afford certain bodily behavior and limitations. This critique of online media seems interesting, as almost all students make daily use of social media (e.g., Facebook). However, the use of these media might relate to other types of affordance regarding personal networks and not educational affairs. The experienced embodiment and enmindment of the use of online media is within another referential frame and not perceived as real affordance in relation to educational sociality. The perceived affordance seems rather connected to well-known settings such as classrooms and instructional education, which is also emphasized in the survey by 79% of the students. The priority of physical presence as a foundation for learning is similar to that of Nonaka and Konno (1998), who adopt the knowledge development process as the starting point in which sociality is the foundation. This makes it a space of originating *ba* and belonging, where people can share feelings, experiences, and mental models and also a space where commitment emerges. “It is a committed unit that ... to be present or to know each other” (students, p. 14).

The tendency to consider the physical study room as a space that requires study activities among both teachers and students might indicate that the physical space affords activity linked to knowledge development, or at least a commitment to engage. This affordance does not appear in

the networked online space in equally optimal ways. Apparently, a room's environment and culture clearly influences the activities. Experiences are embedded and occur in a specific room (Ingold, 2000) and as a student indicated: "When you come here (UCN), then you are committed, you are at school" (students, p. 32).

As revealed in the third observations study, students claim that sociality is a prerequisite, not only for the study group, but also in class. This referential frame of commitment as a component of the preference of communities of practice is also significant in the survey (79%). This acknowledgement of *ba* as a fundamental space to generate knowledge seems to be a general emphasis, as it is a recurrent theme in interviews, observation studies, and in the survey.

Disruption Space and Space of the Future

Computer locations affect the use of online activities. An example is that the home study place affords many other activities than sitting behind a screen. "There are a lot of other things that seem more important" (students, p. 32).

Enmindment and embodiment of the *in situ* mediated activities (Ingold, 2000) make the nested routines of home a boundary object between computer mediated study tasks and everyday tasks at home. The background situation of the home place involves the social-cultural context in which the student is involved, as Dohn (2009) also stressed. The nested routine in the home influences the presence affordance. A student claim they are only 10% focused at home but are 100% focused at UCN demands attention. The different spaces of sociality demand acknowledgement that knowledge development is contextualized and relatively space and activity dependent. Disruptions also appear in online instruction, e.g. in the case of technical problems. As a student mentions: "... it doesn't work and you are disconnected" (students, p. 11).

This might illustrate that perceived affordance could become perceptions of ill affordance, as the sense of affordance can change if several episodes of disconnection and perceived non-affordance occur. Another problem appears when embodied experiences of looking at a screen call

for other activities: “The video transmitted instruction ... it becomes like watching television ... they sit doing a lot of other stuff” (lecturers, p. 31).

The referential whole of the situation that involves nested routines of television watching, leads to activities being carried out away from the attended affordance.

Students do, however, acknowledge the importance of the use of online spaces as an issue for the future, and they are also all familiar with the use of social media such as Facebook. As the survey illustrates, 91% use social media every day. Familiarity with the use of Facebook results in the use of the media as a tool for information exchange and for clarifying the content of a study task. The tendency towards the use of the space as cyber-ba can be said to be in its initial phase. But if only used for information, knowledge separates from ba (Nonaka & Konno, 1998). But the media becomes part of relational affordance, which seems more obvious in face-to-face interactions. Students (71%) also perceive affordance as possibilities for studying independently of time and space. But at the concrete level, it is less clear how this is achieved. However, students appear to be open-minded towards the potential affordance: “They are open towards that Web 2.0” (lecturers, p. 14).

This open-minded attitude might be the foundation for crossing the boundary between the designer and student in implementing BL. The notion of online media as a toolbox, as mentioned by one lecturer, might simplify the concept of mediating the artefact, but on the other hand, it is closely related to the concept of affordance as Gibson(1996) describes it, namely that affordance is what it provides or furnishes.

The Non-Space

As illustrated by the survey, the educational stations are places of non-use (0%). A reason for the neglected possibilities of educational stations might be that students seem to be unaware of their existence: “We don’t know much about it” (students, p. 33).

This kind of hidden affordance (Gaver, 1991), might indicate that the intentional affordance (Norman, 1990) of places related to educational stations might exist with administrators, but is neither real nor perceived

in practice, as Norman (1988) appropriately points out. In this respect, a lecturer notes: “Peace be with them” (lecturers, p. 21).

Thus a correct rejection of the place, cf. Gaver (1991), emerges, as there is no visible mediating artefact for the processes of learning and knowledge development. There are also experiences of contradiction between intentions and reality “because it is the internet connection which distributes it ... so there is ... contrast ... to establish a physical place (training station), and say it is flexible” (lecturers, p. 31).

Another issue that highlights this contradiction is that students, as an aspect of their own development process and shaping of their identity, choose to move from district areas to the city, where UCN is located. “... but if you are 19 years old ... you just adjust to this and move to where your education is” (Student focus group interview, p. 38). “It is typical, well ... they always do (students) ... move to Aalborg” (Lecturers, p. 31).

The relocation of students to the city and UCN indicates that during this period of their life (age 19 to 21) students prefer to extend their social network. Networks are part of the task in shaping a new identity as undergraduate teacher students and their future identity as teacher, which is achieved by moving closer to the physical education environment. Similarly, students seem to associate face-to-face participation with an affordable learning environment and also familiarity with a well-known background. Affordance therefore appears relational (Chemero, 2003). Knowledge is embedded in this shared ba at UCN, and accessibility seems to be gained from moving closer to this social and cultural setting. The physical setting provides space for reflection as well as dialogue. In this way, it affords externalization of tacit knowledge at UCN as a space of interacting ba.

Figure 1 illustrates the collation of results. The figure shows how complex affordance can conceptualize the constraints and possibilities in different learning spaces related to processes of knowledge development. Thus, it is an illustration of the answer to the theoretical questions raised at the beginning of this article.

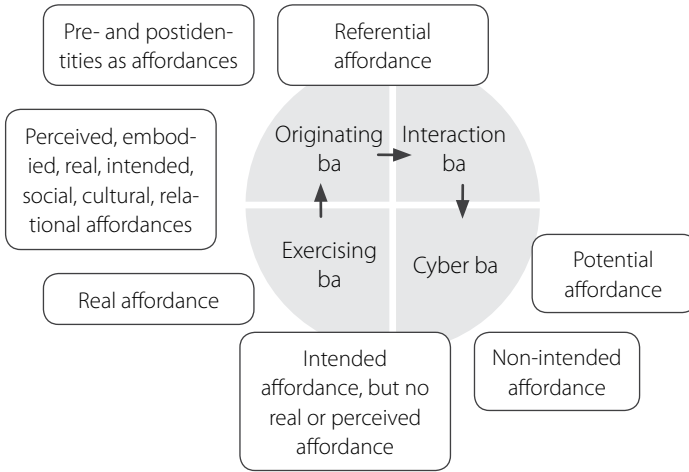


Figure 1. Results of how different kinds of affordance relate to spaces of knowledge development.

In Figure 1, the knowledge development process is connected to spaces at the center of the figure. As this research highlights, there are empirically significant findings that originating ba is the learning space with the highest perceived affordance. Students and lecturers find this space to be highly intertwined with interaction ba (bold arrow in the figure). Cyber ba to a lesser extent (thin arrow) follows some use of tools and some information exchange, but it is also a space that may prompt for non-intended use, such as doing other things that have no relevance to study, dependent on the physical space. Although there are potential affordances in cyber ba, the appearance of constraints in the space seem to have consequences for exercising ba, especially when students begin work in a municipal school. This is why there is no obvious arrow between these two spaces. This demands attention, as knowledge development, and consequently learning, is dependent on the use of all spaces when implementing BL. Additionally, the level of significant priority that students place on sociality in originating ba calls for an increased awareness of this area as a point of departure when implementing new initiatives.

Discussion

Although this empirical study consists only of a small sampling from one university college in Denmark and therefore cannot provide scope for generalization, it points towards some general aspects that should be considered when designing BL in teacher apprenticeship education. The theoretical juxtaposition of affordance and knowledge development (Figure 1) constitutes a conceptual frame of relevance when designing education in the future.

The strength of the methodological approach lies in the connection between the three levels of mimesis and knowledge development described by the model of SECI. This reflected explication of prior tacit knowledge from experienced socialization in the past becomes, in the actual contemporary context at the focus group interview, externalized. Informants combine their knowledge in a common space. In this way, it is a prefiguration, as well as an internal verbal combination. A further combination is made by the author in terms of the configuration of the written data. In the refigurative phase, time has moved from the emerged data in the past towards new discourses in the rewriting. These new perspectives pointing forwards can support both informants and researchers on making further interpretations and internalizing new knowledge in future practice. Thereby, knowledge might develop continuously in the field investigated. It is a process that continues and is, in principle, infinite. The strength of this interpretation is in the arguments and evidence that support it, and the final consensus of those who are knowledgeable in the area. Furthermore, this interpretation is not limited to perspectives emerging from informants. Rather, it adds new perspectives on the field investigated.

As the design methods in this research are primarily based on data from expressed notions, nothing significant can be said about the actual behavior in the different spaces, only about the informants' perceptions of this. However, perceived understanding is also of interest, as it is related to the perceived and experienced affordance.

The significance of the research results regarding affordances coincides with a similar study of students in undergraduate radiography education, which was carried out in parallel with this study (Dau, 2013a).

Conclusion

The questions raised in this article was: What is the affordance of different learning spaces in an undergraduate BL education and what are the actors' prerequisites and reported understanding of the driving forces behind their learning activities in these different spaces?

The findings illustrate significant coherence between concepts of knowledge development and space affordance. This stresses the findings of sociality, identity, and referential structures intertwined and interrelated with spaces of learning (Figure 1).

The constraint and possibilities for student learning, as described under the three levels of mimesis, are fundamentally linked to the affordance, especially perceived affordance, as a basis for action and learning, closely dependent on the space in which this takes place. Different spaces afford different actions or even non-actions in non-spaces, but primarily, the referential frame by the individual and social activities of student and lecturer and embodiment and enmindment is a foundation for knowledge development. Identity has an important feature in perceived affordance and connected actions (Dau, 2013b).

Implications and Recommendations

Complete awareness of complex affordance has not really been taken seriously in the effort to set new agendas for the development and learning management systems of education. The lack of acknowledgement of complex affordances, in spaces and culture, among individuals and communities and the relationships, as well as interactions among these, reduces the role and influence of both humans and artefacts. This neglect of essential dimensions may cause failures at the policy level, administration level, and concrete praxis level. This is why the model described in Figure 1 is recommended as a framework for consideration when planning educational changes, because it is essential to the knowledge development of students. Knowledge development is a key goal in undergraduate education as well as in lifelong learning and economic growth.

The recommendation that follows from this empirical research is that policy makers must acknowledge the influence of complex affordances on learning, for good or bad. The success of implementation depends on situated real and perceived affordance. Policy makers must rethink policies and extend the policy of concepts to the policy of space, since the referential whole of classroom settings, as nested routines for certain traditional learning, can impose limitations on development. For younger students, the solution is not the implementation of local well-known school environments as educational stations. Rather, recommendations must address changes in school environments at university colleges, and perhaps at upper secondary and municipal schools. It is recommended that ordinary physical classrooms be replaced with rooms for sharing, interaction, cyber extra-action/outer-action, and experimentation/exercising. Knowledge development processes may be better facilitated through these spaces. This rethinking of policy, including spaces of affordance that maintain the valuable social space, can be the foundation for real change and success in the implementation of BL.

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Part III

Getting along with Different Learners

9 Conflicting Ideas on Democracy and Values Education in Swedish Teacher Education

Björn Åstrand

Abstract

A decade ago, less than 25% of students in four teacher education programs in Sweden had positive feelings towards their studies in values education. The majority of the students claimed that they had learned the basic concepts, but felt that those concepts were not clearly defined (Frånberg, 2006, p. 151). Consequently, roughly 4 out of 5 students felt that they had not been sufficiently prepared for their role of instilling values in their students. The newly reformed teacher education program was accompanied by an increased ministerial emphasis on values education, but it is unclear what impact it had (Zackari, 2000, p. 11). Studies indicate signs of improvement, but those studies are not fully comparable, so there are good reasons to address these issues again (Åstrand, 2013a). The fact that the majority of students report ambiguity in their understanding of the main concepts of values education suggests there may be varied understanding of the central concepts among teacher educators. The primary aim of this article was to study understandings of and approaches to core terms in Swedish teacher education that relate to democracy and values education. Following that, the analysis also takes into account changes in legislation, policy and reform.

Keywords: Sweden, Teacher Education, Democracy, Values Education, Parry, Constructive Education, Reconstructive Education

Introduction: Historical Perspectives

Teacher education and other professionally-oriented programs in higher education share a common tension between changes in their respective professional fields and changes in the higher education process itself. This study draws attention to Swedish teacher education as a part of Swedish higher education. Key trends, tensions and conflicts in academia relating for example to disciplines, organization, autonomy, purpose and size are well described elsewhere (C.f Arum & Roksa 2011, Becher & Trowler 1989, Berdahl 1990, Bok 1986, 2003, 2006, Christensen & Eyring 2011, Kerr 2001, Kirp 2003, Loss 2012, McNay 2006, Pielke 2007, Rothblatt 2003, 2007, Shapiro 2005, Stevens 2008). As teacher education as an area of professional preparation has a multiple interface with the Swedish school system an introductory overview and analysis of recent change and aligned interpretations is provided below. (Åstrand, 2014)

Divergent Pictures of Swedish School History

Democracy and values education in Swedish teacher education must be viewed historically, and two different versions of the changes that have occurred emerge, depending on the choice of chronological perspective. Shorter historical perspectives tend to take the establishment of a comprehensive school system as the point of departure and embody a particular understanding of school roles in society. The high level of rhetoric regarding the importance of establishment of a nine years comprehensive school contrasts with the rather slow process of planning in the 1950s and implementation in the 1960s (Husén, 1989). To a large extent, the implementation was carried out as long-term trials due in part to a lack of political consensus and to diverse local conditions (Richardson, 2010, p. 114; Marklund, 1980, pp. 8, 231). The standardization of nationally equivalent schools to allow equal opportunities emerged in the 1970s.

Rapid societal change and problems with implementation led to frequent curricular reforms in the 1960s, but the rate of reforms slowed in the 2000s. Debates during the 1970s about democracy in society and the curriculum of 1980 clarified the need for pupils “to practice democratic ways of decision-making” in school (Larson & Westerberg, 2011, p. 114). At the end of the 1980s, policy changes required reforms for decentralization, deregulation, and market solutions to school problems (Lundahl, 2005). The model that emerges in a short historical perspective is typically a centralized school system that provides equal opportunities.

In an extended historical perspective, beginning with the establishment of compulsory schools in 1842, another picture emerges. Local control of schools predominated, and it was not until after the First World War that time spent in schools became nationally standardized (Edgren, 2012, p. 104; Richardsson, 2010, p. 103). Compulsory primary school was a local responsibility and was not a school for all children, but rather for those who would not receive an education otherwise. The establishment of the comprehensive school in the 1960s led to the decline of parallel schooling and private alternatives, and by the end of the 1980s less than 0.5% of pupils attended such schools (Husén, 1989). The comprehensive school reform also increased governmental responsibility for schooling, and education became highly centralized. Rapid change came in 1989 with the transfer of responsibility for schools to local municipalities. Thus, from a longer historical perspective, the Swedish school system is characterized by local responsibility and local conditions, together with private alternatives and parallel tracks.

Table 1. Two Historical Perspectives of Developments in the Swedish School System

Period	Typical	Atypical
Shorter historical perspective 1945–2012	Centralism Public responsibility and ownership Uniformity/Equivalence	Decentralism Private initiatives Variation/Differentiation
Longer historical perspective 1842–2012	Decentralism Private initiatives Variation/Differentiation	Centralism Public responsibility and ownership Uniformity/Equivalence

Divergent Pictures of Swedish School Reforms

It is claimed that the Swedish school system is currently in its most profound reform period since the establishment of public schooling. The 2006 shift in government brought about a new Education Act, a reformed upper secondary school, new educational programs for principals, new teacher education, new curricula, new syllabuses, a new grading system, and new assessment criteria. Teacher education programs have gone through an accreditation process, and a new system for teacher careers has been implemented, together with a system for teacher licensing. These reforms are intended to better prepare individuals for the labor market and to strengthen Sweden as an internationally competitive nation. The recent reforms mirror a narrative that the once great school system of much higher quality than today's schools must be restored.

Included in that narrative is, however, a cause for concern due to the traditional high sensitivity in education to international trends (Waldow, 2008, 2009; Nilsson, 1987, 1989; Husén, 1989, p. 353). After the Second World War, it is claimed that “essentially [it was] Sweden that led the way, becoming the model for Norway, Denmark and Finland” (Telhaug et al., 2006, p. 252) and that “Sweden was the trailblazer and model” (Antikainen, 2006, p. 230). Currently, it is debated whether the initiatives taken in Sweden are appropriate and questions have been raised as to when results may become evident (SOU, 2013, p. 30). The current reforms perhaps draw on what is referred to as “faith-based policy,” (policy that does not rely on evidence, rather belief and faith in the correctness of the policy) both when it comes to the historical narrative as well as contemporary analysis (Jones, 2012, p. 329; Ravitch, 2010, p. 113; Kornhall, 2013). According to critics, the reforms are inappropriate, and their results can be seen in a continued decline in international comparisons (for example Programme for International Student Assessment (PISA), Trends in Mathematics and Science (TIMSS) and Programme in International Reading Literacy Study (PIRLS)).

Reforms in recent years have primarily supported direct teaching and student learning by focusing on teacher competence, clear and transpar-

ent steering documents, and revised structures of upper secondary schools to improve graduation rates and entrance into the labor market, together with increased monitoring, assessments, grading, evaluations, and inspections. Reforms enacted around 1990 were directed towards changing the system by allowing parental and student choice in school, market initiatives, and competition, together with decentralized accountability and local responsibility. These initiatives considerably changed fundamental conditions for education and teaching and learning in such a way that it was considered the most profound reform period since the nineteenth century (Ball, 2007, p. 185; Labaree, 2010, p. 13). The extent of those reforms “transformed the Swedish school system from being one of the most centrally planned among OECD countries into one of the most decentralized systems allowing for wide choice of school types” (Klitgaard, 2007, p. 182; Lundahl, 2005, p. 147; Lundahl, 2010). This observation has recently been reinforced by Levin (2013). In an analysis of segregation, decentralization, differentiation, and individualization, the national agency for schools, Skolverket, found the situation alarming and called for change (Skolverket 2009, 2012, 2013; Jönsson, 1996; Arnesen & Lundahl, 2006, p. 297).

Changes in primary and secondary education usually mirror the interactions between transformative forces in society that permeate schools and directly or indirectly impact tertiary education as well. The role of compulsory schooling has changed and the sheer size of the higher education sector in contemporary society has inevitably changed its role. Levin notes, “The result of [an] increasing number of persons who pursue higher education as [a] result of comprehensive secondary school reforms is that postsecondary institutions are increasingly taking the role of stratification that was traditionally undertaken by the secondary school” (Levin, 1978, p. 448). An important observation is that higher education seems not to have continued this analysis or fully explored its own responsibilities other than those directly related to qualifying students for employment. Consequently, the past decade has witnessed an emphasis on employability, rather than fulfillment of wider educational purposes aiming at realizing the individual’s full potential, developing critical thinking, integrity and other essential capabilities for the role as an active citizen in a democratic

society and a responsible member of a global world and local communities. (Åstrand 2013b, c.f Chan 2013)

Teacher education must adjust to changes in the teaching profession, such as changes in schools, but must also navigate changes in higher education. The focus of this study, democracy and values education, was chosen because these themes are assumed to be sensitive to changes in the field. The aim of this study was to describe key conceptual understandings within teacher education institutions and to try to contextualize and understand divergences in relation to educational reforms and shifting policy and legislation during a significant period of change.

A core concept in this study is the Swedish term *fostran*. When applied to the upbringing of children, it usually refers to intentional initiatives to shape their morality, attitudes, and ways of thinking and feeling, together with their will, including values, priorities, and opinions. Hence, the Swedish term *fostran* differs from the English fostering in the sense that the latter refers to a neutral promotion of something undefined by the term itself where the Swedish *fostran* denotes by itself aspects of socialization and with that included dispositions. The term *fostran* is not fully synonymous with *education*, and when applied to the school context, it also refers to particular values. The use of *fostering* in this text includes those meanings.

Theoretical Perspectives

According to Becher and Trowler (2001), “Change [in higher education] is for the most part small-scale, steady and persistent” and is caused by institutional ambitions rather than the growth of the discipline (p. 100). One might ask, what does that look like in reality? Can change be visible within blurred concepts that echo less functional terminology? For now, however, we leave aside questions of whether these situations can be understood as stages in the evolution of paradigms (Becher & Trowler, 2001, p. 33). The perspective applied in this study views insecurity, diversity, and conflicts within an academic field or in relation to an educational program, not as signs of a problem, but as an ongoing negotiation and an indication of progress.

For many years, research in education has demonstrated the consequences of schooling. The role of schooling for societal reproduction can be perceived as intentional or unintentional as well as clearly visible or barely detectable. In *Democracy and Education*, Dewey (2011) begins by emphasizing a perspective of “renewal of life by transmission” and addresses questions about how knowledge is accumulated and transferred between generations (p. 5). For others, reproduction is a societal process for transferring power and wealth. This study focuses on the intersection between societal reproduction and individual qualification, socialization, and subjectification in terms of democracy and values education. From a societal perspective, values education related to democracy can be understood in terms of ideological reproduction. A liberal and democratic society mandates schooling that attempts to instill within students certain values and dispositions that favor democracy. From an individual perspective, values education can be understood as a process through which an individual becomes more familiar with their own values and becomes socialized in a way that strengthens personality, identity, and self-esteem.

Biesta (2010) suggests three functions of education for the individual: qualification, socialization, and subjectification. These processes prepare an individual for work and a life shared with others, and they promote a mature sense of identity. Others, mainly in the sociological tradition,

have pointed out how education operates on a societal level in terms of control and reproduction (Young, 1972; Swartz, 2002). In the American context, the tension between qualification and control (discipline) also took a slightly different path worth mentioning. Levin (1978) claimed that there was a visible tension between

the reproduction needs of the capitalist production [as it] require[s] highly unequal educational outcomes while the ideology of the educational system tends to inspire expectations and policies of greater equality and schooling expansion to satisfy the aspirations for social mobility. (p. 436)

He also argued that much of the history of education is due to these “tensions and struggles between liberal political forces pressing for equality and the economic ones pushing for inequality” (Levin, 1978, p. 439).

Taken together, the impact of education on these understandings of schooling is of the highest importance and teachers are key players. Thus, teacher education becomes of paramount importance in this regard. But, as touched upon earlier, there are problems with teacher education that motivates an explorative study of the concepts in teacher education programs regarding democracy and values education.

This study is part of a larger explorative study. (Åstrand 2013a) Therefore, the research questions in the current work are quite narrow. How democracy and values education is understood, carried out, and received in teacher education is particularly interesting because it relates to and reveals different educational traditions and cultures in higher education. The understanding of democracy and values education also sheds light on attitudes of autonomy and submission and reveals aspects that are perceived as unproblematic, neutral, and politically correct. It also illustrates how teacher education can be understood in terms of its role in society. Further, it underscores thought on the relationship between epistemological understanding and pedagogical strategies, as well as notions on the formation of an individual during their period of studies. All of these issues constitute future challenges for higher education. In relation to the historical and theoretical perspectives outlined above, the research questions in this work focus on: a) the formal position of democracy and

values education in steering documents for schools and teacher education together, b) the conceptual understanding of democracy and values education in teacher education, and c) epistemological positions and educational strategies among educators and leaders in Swedish teacher education.

Methodology

The first part of this study uses traditional document analysis to identify the position of democracy and values education in Swedish schools and teacher education. The second part draws upon open-ended and semi-structured interviews with 45 teachers and leaders at 12 higher education institutions. The informants were selected through a two-stage process after the institutions were selected (described below). Leaders at these institutions were approached and asked to participate. Two kinds of informants were sought: academic and administrative leaders and active teacher educators. The focus of the inquiry was clarified, and it was left to the institutions to appoint participants. All institutions responded positively, but the distinction between academic and administrative leaders did not regularly match local notions of their organization. At one institution, the leaders asked subordinates to replace them.

More than 25 higher education institutions provide teacher education in Sweden, but there are no independent, single-mission institutions that are typically described as a teacher education institution. The term *teacher education institution* refers here to the organizational structure responsible for the teacher education program within a higher education institution; (or when the term *institution* is used, it refers directly to teacher education).

Although this study was not primarily designed to fully satisfy the criteria for quantitative representation, inclusion of various forms of institutions was required in order to obtain a variety of participants. A first priority was that the number of graduates from the institutions represented a majority of an annual cohort of teacher students (after fulfilling all other criteria, the final selection covered approximately 60% of an annual cohort). The selected institutions represented both large institutions

and small, meaning that the total numbers of students in all disciplines ranged from just 200, to more than 40,000. The size of teacher education programs varied as well, ranging from less than 50, to more than 1,000 graduates. The number of teacher education students as a percentage of all students attending institutions also ranged from a tiny fraction to one third or more of the entire student body.

The year that institutions were inaugurated was considered; thus the sample includes institutions that are only a few decades old, to ones that are hundreds of years old. A wide geographical spread was included, as well as institutions having single and multiple campuses. The selection also included an institution that had distinguished itself through greater student recruitment with non-traditional backgrounds. Institutional status (university versus university college) has been accounted for, as was the designation of an institution as either specialized or general.

Interviews were conducted at participating institutions. Most interviews were with a single person, but some were conducted with two or more persons together, and each interview lasted about an hour. Most interviews had a positive atmosphere in which the interviewee felt free to express their opinions. An indication of this was that I was frequently corrected or something was added when I summarized. Another indication was the repeated, spontaneous expression of appreciation and feelings of importance and inspiration. It must be noted, however, that I was not an anonymous researcher to the majority of the interviewees, as I have played a visible role in national teacher education.

The interviews were, of course, not conducted in a contextual vacuum. But my understanding is that the very idea of a neutral or objective interview is a fallacy. In fact, just by asking persons to articulate their opinions changes the object of a study. My approach was to maintain an awareness of this and to be open and transparent regarding the background, purpose, and my personal context, such that meetings with informants could be as understandable and honest as possible. I agree with Kvale in his discussions about guiding questions; the problem is not the use of guiding questions, but rather the low frequency with which deliberate guiding questions are used (Kvale, 2001, p. 145). Informants and institutions were anonymized with a random number assigned to each person and institution; a U nota-

tion for was used for respondents from a university, and UC was used for respondents from a university college.

To support the explorative approach, an interview protocol was designed to guide the inquiry into key areas, thus aiming at providing an understanding of the relation of core concepts to teaching and learning. The interviews also attempted to focus on problem descriptions, strategies, and key ideas regarding teacher education as an activity within the higher education system. The protocol secured the coverage of those themes, but it also provided opportunities to return to issues from slightly changed perspectives due to ambitions to establish a more secured empirical ground for deeper analysis. The analysis of transcripts was inspired by a bottom-up strategy anchored in grounded theory thinking (Newby, 2010, p. 487). In first stage the author familiarized himself with the interviews by making full transcriptions. In a second stage thematically arranged collections was created providing opportunities to make concepts mapping distinguishing shifting understandings and relationships. Thirdly, interrelationships of different themes of conceptual understandings were tentatively analyzed and described (not presented here, c.f. Åstrand 2013b) and discussed in relation to teaching.

The study also draws upon document analysis of rather conventional type, aiming at describing change in key documents (like legislation, policy etc.) that operates on at a general level and that assumingly impacts on individual understandings of concepts relating to democracy and values education and the notions of what kind of institutional assignment teacher preparation has.

Findings

The primary focus of study is to describe the current understanding of teaching in relation to democracy and values education in teacher education. As an explorative study, the focus is not to evaluate to what degree an institution may be providing programs that are more or less successful in their ambitions. Instead, the purpose is to identify differences in positions, understandings, and strategies. Thus, it is necessary to briefly describe how democracy and values education are formulated in legislation and elsewhere with regard to schools and teacher education.

Formal Position of Democracy and Values Education in the Swedish School System and Teacher Education

Teacher education is more or less in continuous reform. In 2001 and again in 2011, profound national reforms were implemented in Sweden. Over the span of that decade, the Degree Ordinance was also reformed due to criticism in the 2005 national evaluation; the structure of teacher education was changed in 2007 as a result of the Bologna Process and the introduction of learning outcomes. These national initiatives were in addition to local reform initiatives. Given the extent of the reform process, it is less important to identify particular aspects that are associated with one or another program than it is to understand what teacher education represents as a whole going forward from 2010.

A main difference between the two main design models of 2001 (TE01) and 2011 (TE11) is their approach to general educational studies. The TE01 program was structured in three main parts (A general field of education; An educational area; A specialized educational area). (U00.023, p. 1-2) The part focused on general education should include “cross disciplinary subjects studies,” but there was no prescribed content for this part, such as educational psychology or foundations in education (c.f HEO, Appendix 2: Qualification Descriptor, Teacher degree, 2001). The Higher Education Act states that institutions shall promote sustainable

development, equality, and international awareness (HEA 1992, 1 Ch. 5§). General objectives for study programs cover aspects of a student's development of autonomy, integrity, critical thinking abilities, etc., but there is nothing explicitly related to democracy and values education (HEA 1992, 1 Ch. 8-9§). TE11 was restructured and was more centralized. It relabeled general educational studies to educational science studies with a rather detailed content description. TE01 was, in this respect, a bare canvas to be painted, while TE11 describes in detail seven thematic areas. The first theme covers the "history of the school system, its organization and conditions as well as the core educational values, including fundamental democratic values and human rights" (HEO 2011, Appendix 2: Qualification descriptor, Teacher degree, 2011). With TE11 came prescribed content, together with a focus on school educational values, democratic values, and human rights.

Relevant learning outcomes in TE01 required that students be able to "communicate and anchor the values in society and democracy" and "to prevent and counteract discrimination and violation of children and students" (HEO, Appendix 2: Qualification Descriptor, Teacher degree, 2001). 2001). This was partially extended in TE11, but this and other learning outcomes became secondary to subject knowledge. TE01 had a general requirement for knowledge and competence "to be able to realize the purpose of schools" (HEO, Appendix 2: Qualification Descriptor, Teacher degree, 2001). A decade later, this was changed to "knowledge and competence for independent work as a teacher" and "subject knowledge required for the professional tasks as a teacher" (HEO, Appendix 2: Qualification Descriptor, 2011). The higher expectations for subject knowledge results in a decrease in emphasis on democracy and values education, despite the fact that the Degree Ordinance for TE11 includes requirements that students be able to

demonstrate the capacity to make assessments in educational processes on the basis of relevant scientific, social and ethical aspects with particular respect for human rights, especially children's rights according to the Convention on the Rights of the Child, and sustainable development. (HEO, Appendix 2: Qualification Descriptor, 2011)

The debate on democracy and values education in schools has gone on for decades. After the Second World War until the 1980s, the Education Act stipulated that the purpose of schooling was student “acquisition of knowledge and development of skills” and, together with the responsibilities of families, to promote children’s development into “harmonious people” who are socially responsible citizens (Education Act 1962, 1 Ch §1). With the reformed curricula in the 1980s, the perspective shifted to view schools as part of society, mirroring “a democratic understanding of society and humanity [in which] humans are active and with agency, creative and in search for knowledge, [and] able in collaboration with others to understand and enhance individual and shared living conditions” (National Board of Education 1980, p.13). It was stated that schools should *fostra* (c.f above) and that schooling should not only transmit knowledge, competences, and values, but also actively transform and develop knowledge, competences, and values.

This trend of increasing emphasis on democracy and values continued into the 1990s and found its final expression in the 1994 revised school curriculum. The new design included a revised layout that set the tone in the main heading: “Foundational values and tasks of the school”; beneath it was the second-level heading, “Foundational values” and the following text:

Democracy forms the basis of the national school system. The Education Act (1985:1100) stipulates that all school activity should be carried out in accordance with fundamental democratic values and that each and every one working in the school should encourage respect for the intrinsic value of each person as well as for the environment we all share (Chapter I, §2). The school has the important task of imparting, instilling and forming in pupils those fundamental values on which our society is based. (National Board for Education, 1994/2006, p. 3)

The importance of democracy remained the same, but the focus on values became more pronounced. In 2010, curricular reforms again appeared to reduce the importance of teaching democracy in schools. The earlier statement on school activities being “carried out in accordance with fundamental democratic values” was exchanged for the following two lines:

“The Education Act (2010:800) stipulates that education in the school system aims at pupils acquiring and developing knowledge and values. It should promote the development and learning of all pupils, and a lifelong desire to learn” (National Board for Education, 2011, p. 9).

Changes over the past decade are apparent in the governmental proposals for TE01 and TE11. In TE01, the analysis was anchored in a forward- and outward-looking perspective in which emergent knowledge of societal and globalization processes was crucial for contemporary and future Swedish society and demanded “communication and dialogue between humans together with a tentative and examining approach” (Prop. 1999/2000:135, p. 5). In addition, the proposition emphasized that education and development of new knowledge was central to democracy and citizen participation in society, and that teachers were key agents in this “transformation into a learning society.” A decade later, the point of departure was markedly different. The proposal for TE11 also acknowledged that “education can help people to develop their attitudes, knowledge and skills to make well grounded decisions.” (Prop. 2009/2010:89, p.8) But the overall perspective drew mainly on current problems in schools and shortcomings in teacher education. The reforms emphasized teaching skills and subject knowledge.

Two historically different traditions relate to this study. One tradition has roots in the post-war period and focuses on democratic aspects of schooling, taking a more activist approach. The second tradition tends to focus more narrowly on subject knowledge and the importance of the schooling of an individual, rather than a societal perspective.

Conceptual Understanding and Notions on Educational Aims

Democracy can be understood in a variety of ways. Among the informants there were more formal and functional perspectives, together with more normative perspectives (not necessarily mutually exclusive). Thus, educators do accentuate the importance of a more formal knowledge and suggest that teachers need to know things like how government works, how citizens are granted rights, and how they are supposed to participate

in elections, exert influence, and be involved in participatory processes at their workplace, etc. (16U; 20UC; 18U; 23U; 10UC). It is felt that teachers also need to possess “familiarity with the political system, how it works and with what happens if it does not work properly” (16U). Another aspect of this more functionalistic approach is the emphasis on student participation in decision-making in education, regardless of whether it is a normal part of the teacher education program or a component of preparatory learning exercises for their future roles as teachers. In other words, “to experience what it means to have influence and to participate in the educational processes and the shared work can be viewed as a way of dealing with democracy and a preparation for working life” (5U; 25UC).

Democracy as a concept is also presented as a set of values, a way of living, and a desirable approach in interpersonal relations. Democracy is what teachers (and teacher educators) must “preach” and promote (21U). Democracy is “everything ... it is about how we understand each other, it is about behavior and how we approach each other” and “being responsive to each other and trying to take the other’s perspectives” (27U; 13U). These approaches and values are understood as essential for society, education, and becoming a teacher. Another aspect is democracy’s perishable nature; it is something that must be nurtured, otherwise it will disappear and is something “we have to reconquer repeatedly” (19UC).

A normative notion of education can be held together with a more functional understanding, and the normative approach exists in conjunction with values education. In curricula and educational policies, values education plays an important role, but its emphasis has changed over time. In 1999, the Swedish ministry of education declared a year of values education during which the fundamental values that had been articulated in the curriculum of 1994 were to be accentuated (Zackari & Modigh, 2000, p. 11).

It is beyond the scope of this study to describe the complete list of foundational values as used in the Swedish educational context. In the context of purposes for values education, the interviewees seemed to mirror two rather polar interpretations of the aims for values education. One group understands the term *foundational values* to represent a fixed set of values; the other group focused on values as something that needs to be

defined. These two positions relate to the different understandings of what kind of impact values education is supposed to have on student teachers.

Some teacher educators believe that they have an obligation to teach and promote democracy as part of their responsibility as a civil servant who is active in a public business and regulated by law. One educator recalled that he usually challenges his students to make up their minds on whether they are prepared to take on this obligation by saying that teachers have “a mission of indoctrination” (23U; 13U; 24U; 10UC; 1U). This notion of values education tends to include a combination of a fixed understanding of what the values are and an ambition for inculcating them in students. But it also confirms that the public role as a teacher “sets limits as to how much personal resonance there can be” (17U).

A second position argues that the most important part is not the inculcation of certain values, but that students become aware of their individual priorities, i.e., “you have to start with yourself” (15U). Programs have “to strengthen the individual by providing opportunities for self analysis...one has to develop an enhanced self understanding” and students, by “having a seat in the hot chair, will necessarily reflect upon who they are” (7U).

This more reflective and individualizing position is related to a third understanding that draws upon the same logic but is more academic in nature. The main aspect here is to equip students with certain analytical and critical skills and competences that foster integrity and autonomy, together with the capability of reflecting upon various values and related problems, rather than carrying certain values. “Teacher education’s first priority is to instill a critical reflective perspective on values education, not to transmit certain values,” and is “to teach them to think and reflect, not to teach them to pity one another” (2U; 3U).

These three ideas or positions are somewhat mutually exclusive, but in some cases they are linked aspects of teacherhood, which can be difficult for students to navigate and balance. One must struggle with when and where to be a teacher who defends a fixed and obligatory set of values and when and on what issues it is appropriate to articulate personal opinions. The student teacher must ask what impact their scientific training has in this respect and how they should proceed by using both their heart and their head.

Ascribed Importance

In general, it is understood that democracy and values education are important aspects of teacher education programs, the process of becoming a teacher, and teaching itself. It is, according to the informants, “our blood” and “what you are supposed to have internalized as a teacher” (20UC; 1U; 27U; 13U). There are several current metaphors that state democracy and values education are a foundational aspect of society, a linchpin for schooling, the blood, the soul, and a nucleus in becoming a teacher and that these values permeate, or should permeate, teaching and learning.

Democracy and values education are perceived as being of high importance in general, but with a slightly different orientation in different contexts: for society as a whole, schooling, teacherhood, and becoming a teacher. In addition, there are indications of divergent approaches within specific disciplinary traditions. According to some interviewees, the discussions are livelier in such subjects as social science, history, etc., but less so in language studies, mathematics, and science. Aligned with this are diverse ideas as to whether democracy and values education should be integrated into all subjects. To some, this is desirable and feasible, but for others it is neither.

The articulated importance is not matched by any particular initiative to strengthen this area. Such are generally absent and the high esteem of democracy and values education do not appear to have had any impact on design. There are signs of a readiness within some institutions to take ambitions for democracy and values education to a higher level. One institution established local objectives in addition to the nationally prescribed objectives as a means of taking increased responsibility for the area. Another institution has elaborated plans for a teacher program geared towards this area. These are examples of serious attempts to advance teaching and learning in relation to democracy and values education, but they are not common.

Epistemological Approaches to Democracy and Values Education

Important questions to ask are what the relationship is between values and knowledge and whether there is a knowledge side and a values side of content in this area. This is particularly important because different epistemological positions can influence program design, as well as actual teaching. In areas of Swedish teacher education, there exists a shared skepticism towards the possibility of distinguishing aspects of content along those lines. In addition, there is a hesitant approach towards a hierarchical understanding. More generally, it seems to be understood that knowledge and values are interlinked and that this emphasizes the inclusion of “action and agency and the reciprocity among aspects” of what it is to know something (26U). Others make the distinction between values and knowledge, and that content, such as what constitutes a democracy, includes things that students simply need to “know” and therefore, make it possible to test students by fairly traditional means (23U). For some who share this epistemological position, it is believed to be insufficient within teacher education to teach this way because democracy and values are not primarily about knowing, but are “something you have to internalize differently,” and it includes a readiness to act accordingly (6U).

Approaches to Educational Objectives

Epistemological positions relate to the question of whether teacher education involves two parallel objectives, one knowledge oriented and one value and democracy oriented. If so, it must be determined whether they are in conflict.

Approaches to educational objectives, regarding focus on knowledge acquisition and/or promotion of democracy and values, appear to be in conflict (13U). Some interviewees argue that teacher education has both objectives, and some are prepared to understand the expectation to promote democracy and certain values as an assignment to foster teacher candidates as well as other students: “all programs have a task to foster students” (9U; 16U; 12U; 22UC). For others, neither teacher education

nor higher education generally has such a task. One teacher educator had developed a pedagogical approach in which teachers and students in the program take on roles as principals and teachers in a school as an opportunity for inquiry into fostering education (19UC; 11UC).

For those hesitant about the idea of two objectives, there was no concern regarding their mutuality. For others, though, there existed different opportunities and one position acknowledged that there is a conflict between those objectives, either in principle or due to institutional tradition and internal affairs (4U). A common understanding is that there is no conflict, but that in practice democracy and values education are often relegated to second place. According to others, however, these two tasks are “not at all in conflict” and “not independent from each other,” as “you cannot do one without the other” (10UC; 27U; 8U).

Thus, the field appears to be characterized by an ambiguity between whether teaching towards acquisition of subject knowledge has priority over deliberating, fostering, inculcating, or even communicating democracy and values (or vice versa). In both cases, the standpoint seems to be related to personal association with specific academic subjects that may relate to a kind of tribes-and-territory approach, as well as the enduring debate on what constitutes relevant content in a teacher education program. Positions on whether these tasks are mutually exclusive or exist in a synergy appear to be grounded in the same philosophy.

Variety and divergence emerge in a three-fold pattern: both objectives exist in synergy, both objectives exist in conflict, or there is only a knowledge-focused objective. Conflicting attitudes in the area are palpable. Democracy and values education are held in high esteem, but indications point towards a reluctance to launch initiatives to support such education. Notions about the purpose of democracy and values education are scattered between whether teaching should aim towards a more academic approach or to inculcate certain values. Finally, the pattern includes different epistemological positions on learning and knowing, as well as on educational ideas regarding the compatibility of what can be termed as the qualifying aspect of teacher education (as oriented towards acquisition of knowledge) and its more socializing and subjectification aspects (as oriented to, or including, democracy and values education).

Conclusions, Discussion, and Recommendation

Olof Palme, the legendary Swedish prime minister, was the minister in charge of education at the end of the 1960s. He claimed that education was a “spearhead into the future” and that “schools are key to abolish class society” (Nilsson 1989, p. 357; Norberg, 2003, p3.). Decades later, the current minister of education, Jan Björklund, put forth the arguments that “if Sweden shall be in the front among knowledge nations we have to be among the best in math and technology” and that “if Sweden shall be a successful industrial nation in the 2000s then industry has to be provided with qualified labor force.” (Björklund, 2008a, 2008b) The contrast between the perspectives is striking: societal perspectives colored by class logic versus individual knowledge acquisition as a means for industrial competitiveness. During changing times it is appropriate to bring different ideas to the table. The point made here is not the shift from one idea to another, but rather the fact that historically, different ideas can exist in parallel with each other within educational organizations. Ideas can be internalized, endorsed, or just acknowledged differently.

In a time pre-occupied with PISA-scores, Biesta calls for the purpose of education to be reconsidered (Biesta, 2010, p. 26). According to him: “The question of purpose, the question as to what education is *for*, should actually be a central and ongoing concern within educational practice, policy and research” (Biesta, 2010, p. 3). This is not an easy task and he has “come to the conclusion that many of those working in education lack a vocabulary to raise questions about the aims and the ends for education and, in relation to this, often also lack real opportunities for asking such questions” (Biesta, 2010, p. vii).

The purpose of Biesta’s research is to facilitate the discussion by outlining useful parameters as a framework for the discussion (Biesta, 2010, p. 19). Hence, he points to the traditionally established three primary functions of education: qualification, socialization, and subjectification, and concludes that we must acknowledge that the purpose of education is a composite question. In this sense, the discussion of quality in education

is impossible without acknowledging “the different functions of education and the different potential purposes of education.” Given this, discussion about quality in education is according to Biesta only meaningful if we recognize that these three functions are integrated in such a manner that when “we engage in *qualification*, we always also impact on *socialization* and on *subjectification*” and similarly “when we engage in *socialization*, we always do so in relation to particular content and, therefore, link up with the *qualification* function and impact upon *subjectification*,” an observation that is instrumental to this study (Biesta, 2010, p. 22)

This theory draws attention to the fact that changes in one aspect of education policy do impact other aspects. Such a shift has occurred; strengthening of the qualifying function of schools and stressing employability in higher education has affected socialization and subjectification, which are functions related to democracy and values education.

It seems relevant to address the variety and ambiguity of concepts and understandings in the area from another perspective as well. The above quotations from the two noted politicians relate to their more fundamental notions of society and strategies for change. In one respect, they both educationalize societal ambitions. If Palme wanted to abolish class society, other targeting strategies are available for use; and if Björklund wanted to strengthen Sweden as an industrial nation, other, more direct, strategies are available. In the end, however, both men transformed the problem into something that was possible to deal with in an educational context.

Politicians and educationalists express different ambitions for schooling. Parry (1999) proposes a distinction between *constructive* and *reconstructive* political education, which is a useful analytical framework for this study. According to Parry, there are discernable “family resemblances” among a number of “thinkers” and “political theorists” when it comes to thinking about education (1999, *passim*). From his point of view, there are a number of “utilitarians, certain conservatives and defenders of ‘realist’ democracy” who take the constructive or redirective position and “communitarians and participatory democrats” who take the reconstructive or regenerative position. (Parry 1999, p.23, 29)

Table 2. Constructive and Reconstructive Education (Parry 1999)

Constructive (Redirective)	Reconstructive (Regenerative)
<ul style="list-style-type: none"> - Realizable by non-radical reform. - A less thorough shift, even though it might bring about significant political change. - Takes human nature and interests largely as a given. - The task of education is typically to redirect the goals towards perceived national priorities. 	<ul style="list-style-type: none"> - Requires qualitative changes in economic, social, and political structures of a nation. - Aims to bring about a qualitative change in the mind-set of a generation in order to effect a similar change in political attitudes and behavior. - Seeks to produce "new" persons and transform their priorities and ways of understanding the world

The changed formal position concerning democracy and values education within the steering documents has been described above, together with the discourse among educators and leaders in teacher education through the interviews conducted in this study. In the analysis the following elements was focused:

- the importance ascribed
- conceptual understandings
- purpose and desired outcome
- epistemology
- approaches to educational objectives.

A typology based on these elements related to Parry's theory and mirroring a reconstructive model might consist of: a) holding the area in high regard; b) having a conceptual understanding of democracy that could impact individuals and society at large (such as a normative understanding of democracy); c) a desired outcome, including inculcation of prescribed democratic values; d) an epistemology that connects knowing and learning to both values and readiness for action; and e) an approach to educational objectives that understands the more knowledge-oriented assignment for schools in a synergistic relation to the democratic one, and vice versa. A more constructive type would contain much of the same estimation of the area, but would tentatively take epistemological positions that are less integrative and tend to differentiate or distance the two tasks from each other. Such an approach would also include the idea that students need

to get in touch with themselves as individuals and develop an academic capability for interpreting and understanding values, rather than internalizing certain prescribed values.

Such an analysis suggests that the reconstructive concept more closely resembles the ideas in the welfare state and strong society context and fits with Palme's view. The constructive approach is indicative of the impact of the neoliberal turn in society and education. It is possible that the vagueness in the discourse has to do with a slow and less-articulated shift that has occurred in stages. Traditional academia, with its discipline-oriented approach, internal priorities, and understanding of the societal role of higher education, along with ideas about the desired effects on students in the 1970s, appeared to harbor professional programs as teacher education. With inspiration from Parry, we can understand the shift in educational policy during the period as first a radicalization into a reconstructive model, a shift that later on turns into a constructive approach. Such a shift in a structure such as academia, a non-consensus oriented business, would most likely allow for parallel perspectives to persist and would continue having an impact through individuals striving for one or another point of view. These would be reinforced by ongoing societal discussions concerning the state-of-the-art in schools, rather than addressing the purpose of schooling in an articulate manner.

This analysis is plausible, but only tentatively so. It rests upon assumptions about what is more radical and what is less so when it comes to political schooling. Such assumptions are contextual and relational and therefore notoriously difficult to pin down. Nevertheless, the framework that allows such an analysis points towards a critical issue for education in a liberal state, a state that grants individuals the freedom to develop all kinds of ideas and beliefs, and a state that is neutral in every respect but one: it can never be neutral about its own neutrality in this respect (Parry, 2003, p. 39; Rawls, 1971, p. 199). The task to reproduce values supporting such a (liberal) state appears to be as essential as conflicting. This political dimension of teacher education is as important as other aspects, and the findings here suggest that educators and leaders struggle significantly with this task to make sense of it in an academic context that usually avoids taking an ideological stance. That kind of assignment makes teacher education vulnerable and invites criticism due to conflicting political perspectives.

These findings suggest that there is a need for a broader deliberation on those issues in schools, in teacher education, and in higher education institutions. Such deliberation should advisedly be informed by comparative studies that take different professions into account, as well as education in different countries and regions. In addition, findings point to the need for all teacher education programs to reflect upon how they can best communicate with their students in this respect and facilitate the cooperation of teachers to promote the objectives of democracy and values education. Educational policy is somewhat of a moving target, and consensus is not to be viewed as the first priority; rather, it is to support this ongoing conversation with research and development of a coherent and appropriate terminology.

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10 Demands and Challenges: Experiences of Ethiopian Rural School Teachers

Kati Keski-Mäenpää

Abstract

Rural schools in Ethiopia are characterized by high drop-out rates, a lack of teaching materials, and low learning achievements. This study examines the experiences of teachers who work in such schools and emphasizes that their work can make significant contributions to the development of education in Ethiopia. The paper seeks to answer a question: 'How do the teachers perceive their work situation and how could this be improved?' The findings show that according to teachers' opinion the current principal challenge is the tension between strict curriculum requirements, associated with annual testing, and follow-up, while the government insists that teaching should be more student centered.

Keywords: Rural Schools, Sub-Saharan Africa, Teacherhood

Introduction

My first day in Kambata School: I walk through the gate to large school yard. Grass is growing high, older students play volleyball and smaller ones run by bare foot. There must be hundreds of them! They are not wearing uniforms. Later I hear that the dean and teachers have made the decision not to demand that families buy uniforms. Parents are farmers and it would be impossible for them to buy uniforms for all children. In that case they could not send all children to school. Good decision! (Diary, October 10, 2011)

Ethiopia has the most limited access to education of any country in Sub-Saharan Africa, although the situation has improved greatly over the last few years. About 90% of children start school, but only 20% achieve their primary-school certificates. There are many reasons for drop out—having to help at home, getting married, being unable to purchase a uniform, etc. (Lasonen 2005; Mulkeen 2006). Drop-out rate is slightly lower for boys than it is for girls. Concerning regional variation, the highest drop-out rate is observed in the Somali region. (MoE 2012).

Beginning in 2000, the government of Ethiopia began to spend more on education than ever before (World Bank, 2005, p. 32). The Education for All Global Monitoring Report (UNESCO, 2012) indicated that the proportion of children not attending primary school had decreased dramatically from almost 60% (2001) to 20% (2010). Despite these achievements, there are still more than three million of out-of-school children in the primary age group that have never enrolled or that have dropped out of school (MoE 2012). The worst situation is with disabled children. For example only 2-3 % of deaf or blind children have access to school. Reasons for that are the attitudes towards disabled children and lack of suitable school services (Keski-Mäenpää, 2013; MoE 2012).

It remains difficult to get children to school at the correct age and to have them progress to completion the school. 87,6 % of boys and 82,5% of girls are at school at the age of 7 and the amount rises to 90,9% (boys) and 87,7% (girls) at the age of 8 (MoE, 2012). Starting school late correlates with drop-out and is one of the major barriers to achieving primary

education (MoE 2012). Reasons for starting school late are long distance, health and nutritional status and un-awareness of the importance of sending children to school in a timely manner. Also child labor is common both in rural and urban areas of the country. (Lasonen, 2005; Mulkeen, 2006; MoE 2012.)

The educational gap between rural and urban areas can be described as drastic. Richer city households are able to spend significantly more money on education, thereby providing children with better quality schooling. This includes private schooling or private tuition (UNESCO, 2012). Rural schools have very modest buildings (often made of clay). However, children often lack text-books and teachers lack the instructional materials. Student-teacher ratios are very high. In addition, HIV/AIDS infection is likely to increase. It will influence the already serious teacher shortage (Lasonen, 2005, p. 10). The rural population constitutes 84.4% of Ethiopia's total population (World Bank, 2012).

Many reports on rural teaching environments in Sub-Saharan Africa have appeared, but very little has been written on teacher perceptions of how such environments impact teaching and learning. Often, the analysis or statistical research does not reflect differences between urban and rural areas. Sometimes, information from rural areas is even excluded because of complications in collecting data from remote, hard to reach areas (Buckler, 2011; Mulkeen, 2006).

After living for more than six years in Ethiopia, I became interested in the teaching standards of Ethiopian teachers. I had read many articles about great improvements in access to schools, but I needed to hear about teacher experiences directly. The purpose of this paper is to present the voices, feelings, and perspectives of rural school teachers.

This paper examines the challenges in the rural schools of Ethiopia. It seeks answers to questions about major challenges in rural schools and how these challenges impact teaching and teachers' work at the schools. The paper begins by defining the conceptual framework of the research. The Ethiopian school system, a relevant new policy termed CPD (defined later), and school development theories are briefly described. Next, the research method and findings are presented. In the conclusion, I discuss the tensions between the new CPD policy and the requirements of the

strict curriculum and follow-up system, noting that this poses problems in the minds of teachers.

Contextualisation: Schooling in Ethiopia, Rural Schools' Problems

General education in Ethiopia consists of 8 years of primary education and 2 years of general secondary education, which is followed by 2 years of upper secondary education. Primary education is split into grades 1-4 (primary first cycle) and grades 5-8 (primary second cycle). Preschool education lasts for 2 years and is for children aged 4–6 years. It is not compulsory. Only 11,7% of children attend the pre-primary education and they are mostly in urban areas. The official age of entry into primary school is 7 years. Many children start school later. This often results in early drop-out and lower levels of educational attainment (MoE 2012).

Even today, not all children are sent to school. In total, 63,4% of primary aged children (age group 7-12) and 70,1% of lower secondary aged children (age group 13-16) attend the school. Drop-out is more common in rural areas. Feredes and Erulkars (2009, pp. 7–8) interviewed girls who had never been to school, and explored why this was occurring. More than half of all girls (57%) reported that their families could not afford schooling. Family disapproval (15%) was next, followed by the burden of domestic responsibilities (10%). Six percent of the girls reported that no school was within easy access of their home. Other reasons for not attending school included marriage (3%), death of parents (2%), lack of interest (2%), and illness (2%). As almost 50 % of adults work in agriculture and forestry, children are needed at home. They help parents in the fields or take care of younger siblings.

Children in rural areas are considered difficult to educate (Mulkeen, 2006) because of minimal parental encouragement, demands on their time, and the perception that the curriculum is not related to everyday life. Most parents are farmers and many are illiterate. The literacy rate of

adults aged 15 years and over is only 30% (UNICEF, 2010). Teachers report that parents often do not understand the importance of education for their children and regular attendance at school. Even when parents understand the importance of schooling, they may be unable to support their children in learning. Parents in rural areas often have low levels of education and may not value schooling. Many rural households are dependent on children for help, especially at harvest, but schools usually operate rigid schedules, both in terms of school hours and term dates (Mulkeen, 2006). Child labor is one of the major impediments that affect children's school attendance. 42% of rural children and 29,1 of urban children tell that combining work and schooling affects their schooling (MoE 2012).

Families are vulnerable because droughts are frequent and they are thus often unable to purchase uniforms, notebooks, and pencils. Families in rural areas are big; there may be 6 to 10 children in a family. Uniform requirements inhibit attending school (Grieve, 2009, p. 159), especially in rural areas. Most schools require children to wear uniforms. The EFA report (UNESCO, 2012) found that cost was the primary reason that parents did not enroll children in school or took them out of school. Although school fees have been formally abolished in Ethiopian governmental schools, unofficial fees are still levied (UNESCO, 2012).

Rural schools are usually owned and controlled by the government. They have strict curricula and teachers make annual, weekly, and daily lesson plans. A "Woreda" advisor from the district education office visits monthly or more often.

Working as a teacher at Sub-Saharan schools is challenging. Schools are over-crowded and under-resourced, teacher housing is insufficient, and salaries are low (Buckler, 2011).

New Approach to Education: Continuous Professional Development

Many African countries, including Ethiopia, have made substantial progress towards improving access to primary education. The Ethiopian government has worked hard to attain millennium goals. Educational access has improved greatly, but quality remains a major challenge. Low levels of educational quality negatively impact learning outcomes.

The Ethiopian Ministry of Education (MoE) has emphasized the need to develop teaching quality (MoE, 2009) and launched a new approach to education, referred to as Continuous Professional Development (CPD) and is targeted at primary and secondary school teachers, leaders, and supervisors. The idea is to promote more active learning, problem-solving, and student-centered teaching, rather than rote learning and lecturing. CPD seeks to enhance student achievement (MoE, 2009). Ethiopian schools, like other schools in Sub-Saharan countries, have a long history of rote learning, copying, and lecturing. The new policy statement has raised many concerns among teachers.

It is mandatory that teachers embrace the new policy. The verbs “must” and “have to” are repeated many times in the 39 pages of the plan. The CPD framework states: “CPD is a compulsory requirement for those who teach in all Ethiopian educational establishments. It is the civic and professional duty of all educators to engage in Continuous Professional Development,” (2009, p. 12) and later, “All Ethiopian schools are required to produce School Improvement Plans in order to improve the quality of teaching and learning. CPD is an essential part of school improvement” (MoE, 2009, p. 14).

The overall aim of the new policy is to improve student achievement. The policy also seeks to improve classroom teacher performance. The policy emphasizes a “career-long process of improving knowledge, skills and attitudes, centered on the local context and particularly classroom practice” (MoE, 2009, pp. 15-16).

CPD methods are described in a document that is given to all schools and includes examples. The document mentions that teachers should plan

lessons together; conduct demonstration lessons, workshops, and action research; and engage in team teaching. "Woreda" (the district education office) and sub-city education officers are responsible for monitoring and evaluating the CPD activities of schools. Teachers are also required to maintain a portfolio with a record of their CPD activities (MoE, 2009, p. 39). "Each school teacher must take part in planned CPD activities for a minimum of sixty hours each year" (MoE, 2009, p. 26).

Serbessa's (2006) research in Ethiopia showed that although policy emphasizes innovative teaching and learning, traditional lecture methods still dominate most classrooms. Rote learning and teacher centered learning methods were observed in this study. Lessons followed the same pattern. Teachers taught certain subjects by writing notes on the blackboard. Students copied the text to their note books. If the teacher asked questions, they were closed-ended; students were able to answer the questions only with one word, and only one option was correct. Open-ended questions were not used.

School Developments

Ministry of Education has worked hard to develop schools in Ethiopia. According to the goals of EFA access to schools has improved. Study books have been printed with the help of World Bank and other organizations. Still the learning achievements are remaining low.

According to Buckler (2011) not enough attention has been paid to the training needs of teachers in rural areas. Attention has been paid to improving access to schools, but training, recruiting, and retaining good quality teachers is still a major challenge in Sub-Saharan Africa. Pre-service and in-service teacher education is increasingly recognized as the key to achieving good quality education for all children. Meaningful teacher education policies are critical for developing good quality teacher education programs (Buckler, 2011), and Ethiopia has risen to face this challenge by creating the new CPD policy.

Professional development programs like CPD (Continuous Professional Development) are systematic efforts to bring change in the classroom practices of teachers, in their attitudes and beliefs, and in the learning outcomes of students (Guskey, 2002). CDP has emphasized the improvement of learning outcomes as a main goal.

Often, like in Ethiopia, teachers are required to take part in professional development by government or other authority. Still most of them report that they engage in these activities because they want to become better teachers (Guskey, 2002.) Also in Kambata-school teachers were highly willing to attend all the meetings and workshops we had during my visits. For them, like teachers in Guskey's research, becoming a better teacher means enhancing student learning outcomes. They need advice on how to use active and student centered teaching methods in their day-to-day work. According to Guskey, development programs that fail to address these needs are unlikely to succeed. Knowing the theories is not enough, teachers need concrete and pragmatic advice on how to improve their students' achievements, or like in this research, how to use new teaching methods.

According to Guskey (2002) the three major goals of professional development programs are change in the classroom practices of teachers, change in their attitudes and beliefs, and change in the learning outcomes of students. Significant change in teachers' attitudes and beliefs occurs primarily after they gain evidence of improvements in student learning. The CDP program has been proposed to teachers in 2009. The theories of active teaching methods are now widely known, but they are not in practical use yet. Therefore improvements accomplished by use of active methods are not evident yet.

As a comparison, child-centered pedagogical reform has been undertaken for example in India, where government primary schools sought to reform dominant modes of textbook-based, rote-oriented, authoritarian, and didactic instruction, with the promise of more child-friendly, democratic learning environments. Research by Sriprakash (2010) showed that child-centered models do not always impact higher level learning and he questioned whether national and global development goals of providing quality education for all can be achieved through child-centered pedagogic reforms. At least methods should be contextualized to the local culture, not brought from abroad.

Method

Data for this paper has been collected during several visits at Kambata school. It was collected using group-interviews and observations in one of a rural government school in South-West Ethiopia. Kambata School (the name has been changed), had 1,400 students and 38 teachers. The teachers were 22 to 65 years of age. A few of the oldest teachers had been teaching locally since their graduation and the youngest ones had just graduated from teacher training college. One of the youngest teachers trained during the summer for a master's degree; a few teachers had bachelor degrees; most of the teachers had taken college-level training. There were 12 female teachers and 26 male teachers.

Teachers whose comments I am using in this paper are (names are changed):

- Almaz – female-teacher, lower cycle
- Gennet – female-teacher, upper cycle
- Tekle – male-teacher, lower cycle
- Dawit – male-teacher, upper cycle
- Asefa – male-teacher, upper cycle
- Bekele – male-teacher, upper cycle

The students are principally from agricultural families with 6 to 10 children. The area is mainly Christian. The Kambata School is typical, similar to other rural government primary schools in the area. Older buildings of Kambata School are made of clay and newer ones of cement. Newer buildings have electricity for part of the day. The school has no running water or internet connection.

All teachers from both the primary and secondary schools were interviewed in three groups using semi-structured interviews. Some themes had been predetermined, but many emerged during the interviews. Informal discussions with teachers (for example, during coffee breaks) also yielded data. The fieldwork was carried out during 2011 and 2012, with several extended visits to Kambata School (a total of three months).

Young teachers were the most willing to provide information and three of them became key contributors to this research. At first the school principal was present at most discussions because he seemed to take a particular interest in my work and probably control the issues I wanted to talk about. Usually, he either participated in the discussion or simply listened, but on one occasion, he asked me not to continue an interview because I was asking excessively sensitive questions about teacher corruption. Because I wanted to interview teachers privately, I did later interviews in school library, and the principal did not attend them.

All interviews and group discussions were recorded. Most discussions were in Amharic, but some were in English. Some discussions in homes or classrooms were not recorded, but I made field notes. I also took field notes during lessons.

A participatory ethnographic method was used in this research. It includes participant observation, which means observing subjects and establishing a place in natural setting in order to investigate, experience and represent the social life and social processes that occur in that setting (Emerson, Fretz & Shaw; 2010, 352). Becoming a participant inquires considerable time in the field, doing what the subjects do, eating what the subjects eat, noting, recording, thinking, learning and gaining trust (Rock, 2010, 32). My aim was to understand the reality where rural school teachers work and live. I needed to become one of the community and an active participant of the school, and this method was suitable for that. I wanted to put myself in my "participants' shoes" and one way to do that was to work as a substitute teacher at the Kambata school.

On of the teacher was sick today and I substituted him... There were 64 students in the class room (8th grade) and I had to teach math for them. Content of the lesson was very challenging, all of the students did not have their own books and all I could use was a black board and a chalk. But they were listening silently, behaving really nicely and answering my questions. But yes, I missed calculators and teacher guidance book a lot! (diary 13.1.2014)

Observation and participation are characteristic features of the ethnographic approach (Rock, 2010, 4) and through participation I got infor-

mation I could not have found only through interviews. I visited teachers' homes, went to see newborn babies and lunch several times with the teachers. I saw that ethnographic research is not passive or neutral. It is interactive and creative, selective and interpretive (Rock, 2010, 30). When I arrived to Kambata school I never knew what kind of data I would get and in what kind of situations. Would it be interview in the rest room or conversation outside middle of students?

One aim of ethnographic research is to produce descriptions that explain the world that has been researched to others (Emerson, Fretz, & Shaw, 2010, p. 352). The Ethiopian and European contexts differ greatly. Here, I will try to bring some insights and feelings of the Ethiopian context to readers by referring to my field diaries. This will hopefully afford a deeper understanding of the issues. Field notes are always selective. I chose to include notes that seemed significant at the time and omitted other matters that did not seem significant (Emerson, 2010, p. 353).

The analysis is based on ethnographic content analysis and consist of interviews, field-notes and discussions. Analysis happened in all stages of research. Pre-analysis has happened on the field already while I was doing fieldnotes and discussing with teachers. It continued in Finland while I was reading and coding the data. I had also a chance to discuss with Ethiopian colleagues in Finland and I could ask their opinions about my analysis. It deepened my understanding of the issue. I also discussed about my analysis with the Kambata school teachers. According to Rock (2010; 37) it is good to present the analysis to one's subjects because it is their lives that one is reporting and one may have got things wrong.

Analysing has not been linear, but more like a cycle and a long, slowly developing and deepening process. Ethnographic research is more a continuation of fieldwork rather than a transparent record of past experiences in the field. The experiences and feelings of the researcher are connected with an area of knowledge and cultural analysis. (Tedlock 2000, 455.) My feelings and thoughts are part of data as well as interview material. I was lucky to be able to return back to the school many times. When I read the data at home, new questions emerged from it and I could continue the discussion later. I made the questions for the data, but also questions emerged from these data.

Ethnographers' lives are embedded within their field experiences in such a way that all of their interactions involve moral choices. (Tedlock 2000, 455.) I reflected my role at the school in all stages of research. Often it was not clear whether I was a researcher or a friend. When I started my research my role was clear, I was someone from abroad conducting research. All teachers were told about the research and how data would be collected. They knew I was a researcher, but during the weeks and months of contact, I became more like a colleague and resource person, often asked to provide feedback on lessons and describe the Finnish mode of teaching. The present research was later transformed into action research and I became more of a supervisor or advisor. I always felt very welcome. One teacher told me,

When you are here, we become better teachers. We try to plan better lessons and we are more active. You give us feedback and also we give feedback to each other's more than before. I feel we are developing professionally during those weeks when you are here. (Almaz)

In the analysis I coded different themes and tried to find connections between them. I saw that the culture and demands of it are linked with many challenges at school. This became central founding in the analysis. Themes emerging from the data were:

- 1) *Classroom challenges*
- 2) *Working environment*
- 3) *Status challenges*
- 4) *Expectations of the government.* This was indicated to currently be the most challenging issue. I will present these challenges in subsequent sections.

Results

Classroom Challenges

Class-room walls are made of brown clay; the floor is dust. The front wall has a chalk-board but there are no posters or other material on the walls. There is one small window. There is no electricity; is the light adequate for children with poor eyesight? Are there any such children here? Children sit incredibly close to each other; there are 78 in all. Each group of five seems to share a book. The children are silent and wait for the teacher to begin the lesson. (Diary 11.10.2011)

During the first weeks of observation, it became obvious that the lack of teaching material poses great challenges for both teachers and students. This was also the most common issue mentioned in teacher interviews. The student-book ratio is 5:1. The only teaching materials used in class-rooms are a black-board and chalk. Lack of teaching materials affects student achievement. When five students share a book and take it home in turns, they cannot effectively study at home after school. In Ethiopia, most of the families in rural areas do not have books or computers.

The teachers remark that lack of teaching materials is a constant and major problem. Teaching without proper material is difficult:

We have shortages of books. What we have here are outdated books. It is impossible to get books for students and teachers. The number of text books and the students is very different. Teachers are struggling and doing their best to use the limited source. (Gennet).

If there were books, they were not always suitable for rural schools. “The books are prepared for the urban students. But the rural students don’t even spell. So the book content is far from their capacity. And this is causing problems on the teaching process” (Gennet).

Lack of teaching materials in combination with high student numbers promotes use of one-sided teaching methods. The use of methods involving student activity is challenging because schools do not have any extra material wherein students could find information by themselves. They do

not have access to the internet. Kambata School has a library with a few dozen books, but they are mostly old school text books.

The World Bank has become aware of the lack of teaching materials and has stated that the government should ensure that schools receive the human and financial resources they need. Classroom facilities and school numbers must be consistently and routinely addressed. Vulnerable groups should receive the assistance needed to participate in schooling (World Bank, 2005, p. 29).

Working environment

Getting to school and teaching are challenging for many rural school teachers because of long distances from home to school, lack of transportation, and job exhaustion. The Kambata School is made of clay and in the dry season, classrooms are very dusty. It is usual for neither water nor electricity to be available.

Especially in our area teachers of rural schools do not have a place for a rest. They come far away. Other office workers have a tea break at 10 o'clock. But teachers don't. They just go to their teaching directly without any rest. (Tekle).

Teaching in ill-ventilated classrooms containing 80– 100 students is exhausting. The dry season temperature is often very high. Teachers describe the teaching and learning environment as quite discouraging, especially during the afternoon shift (Negash, 2006, p. 33). Schools are overcrowded; more than 20% of government primary schools have more than 900 pupils, and about 25% of government secondary schools have more than 2,500 students (World Bank, 2005, p. 34). Rural schools are more crowded than urban schools.

Some people come by bus from far away and half of the way they take a walk to get in to the school. The government policy command to teach the whole day, but that is too difficult to do. Some people get here even before they eat their breakfast. There is nothing provided to refresh them and the job is overloaded. (Tekle)

A previous report (Gemedo et al., 2013) found that teachers in Ethiopia felt overloaded because of long travel distances, no opportunity for rest, and long working hours. Today, policy training sessions have been added to the workload; teachers often have many non-teaching responsibilities.

Status Challenges

The salary of teachers is low compared to that of other educated groups. This affects their ability to eat adequately and dress appropriately. There are other effects:

Teachers don't have capacity to build their own house. Because of that they are facing problem in marriage. They can't marry whom they choose. In our area someone has to have his own house to marry someone. Otherwise he is no going to be chosen by female. (Dawit).

Interviewees mentioned that previously, teachers had been viewed as professionals and had enjoyed a high status in the community. The culture had accorded respect to teachers and older people. This situation has changed due teacher poverty.

Teachers are not respected by the community anymore. Farmers and merchants have a better capital than teachers. So people undermine them. Even the students do not respect them. Students in the class need to be superior, because they have better dresses, mobile ... In this situation teachers cannot tolerate to teach here and they move to South Africa and Sudan. They can get a better life there. (Dawit)

The rural teachers earn a salary of 100-150 euros a month depending of their education level. That money is not enough to cover the monthly house expenses. It is not enough even to buy one quintal of teff (local grain). Economical problem causes stress to the teachers. The gap between teachers and other people has caused loss of confidence. (Asefa).

Expectations of the Government

Teachers felt stressed because the government unrealistically expects that they will follow-up with each student. The number of students in classes makes this impossible:

At grade one there are 80 to 90 students. Reaching those 90 students is teachers' burden. He can't reach all those students. One teacher teaches five subjects each class. Teaching all five subjects and evaluating each student's performance is difficult. Each book has annual, monthly and weekly plans. Teacher has to finish the book at the end of the semester. Following up each student and assessing their achievements is a big stress. Actually the problem is the policy. It is difficult to apply the policy. Just for the sake of survival we have to accept the policy even if following the students is impossible. (Dawit)

Teachers were often unwilling to discuss policy or government, but mentioned the demands of government many times during the conversation: "Teachers try to satisfy the interest of the government policy and their own career" (Asefa).

Government has stressed the need to develop country-wide teaching methods that are more student-centered. Indeed, in countries such as India, child-centered education has been advocated to address low student retention and low achievement in rural government primary schools. Pedagogic renewal in Indian primary schools has sought to replace the dominant modes of textbook-based, rote-oriented instruction that are authoritarian and didactic with more child-friendly, democratic learning environments. (Sriprakash, 2010, p. 297.)

This situation raised many concerns in teachers: "I know it is a good idea, to teach children in student centered way, but I have no idea how to do it. Well, I know it in theory, but how to do it in practice?" (Dawit), and

We have had theoretical courses about how to use Student-Centered-Teaching methods, but we have never seen anybody to really use it. It is difficult just to begin teaching in a new way. Our method is writing on the black board and students hear that and forget it after a while. (Asefa)

Teachers are teaching the same way than they have been taught in their own school time. According to Brown (2004) the most resilient teachers' conceptions of teaching come from memories of their own schooling and observations of their own teachers. The teachers know the theory of student-centered teaching but feel that it is difficult to teach that way rather than lecturing: "Yes, I have got courses of student centered methods. It is good idea, to make students more active. We are trying to implement the idea. But it is hard" (Bekele).

According to the interviewees, one obstacle inhibiting use of student-centered teaching is the fact that the culture hinders the use of debate and questioning of teacher opinions. In Ethiopian culture, a teacher serves as an authority. Teacher-centered methods reinforce that role.

How could I use debate or discussion as a teaching method? I should know the goal, where the discussion certainly ends. If students ask me very difficult questions, I cannot say that I don't know the answer. In our culture teacher has to have the knowledge. (Tekle)

Most teachers like the idea of student-centered teaching, but they do not know how to apply it. Some are not interested in the idea, but still feel they have to obey governmental policy. "We have to do what is told. The teacher is still working as much as he can but do not have mental freedom" (Asefa).

The Ethiopian government expects teachers to use student-centered teaching methods that were never used to teach the teachers. The curriculum lists detailed outcomes for each subject and formal annual tests are held. Test results are used to rank schools. Teachers are challenged when asked to cover the entire subject content. "We can't teach anything outside of curriculum. First, time is not enough, because we have to cover everything in the curriculum. Secondly, supervisors are following our teaching. We are not allowed to teach outside of curriculum" (Bekele).

Discussion

Ethiopian schools face many challenges, most of which are more serious in rural areas. In this research, I have related how teachers at Kambata School view the lack of teaching materials, low salary and status, workloads, and the expectations of government. These challenges are interlinked. For example, a lack of teaching materials and large class sizes hinder fulfillment of the expectations of government that student-centered pedagogy will be introduced.

Teacher-centered teaching methods have been used in Ethiopia, as well as in other Sub-Saharan countries, for decades. Figure 1 summarizes the challenges faced by rural schools. We see that the teaching context in rural areas of Ethiopia do not support child-centered teaching methods, but do support teacher-centered teaching methods.

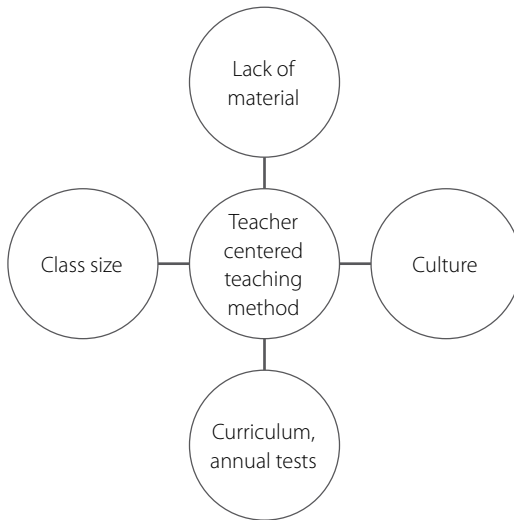


Figure 1. Summary of the challenges faced by rural schools.

Lack of material. Teaching material is often not available and students cannot get information from the internet or textbooks. It is easier to lecture than to find or make extra sources of information.

Class sizes. When almost 100 students sit in any class, it is easier for a teacher to lecture rather than to employ group work.

Culture. The teacher has traditionally been seen as a source of “correct” information. It is not appropriate to argue, debate, question, or doubt the knowledge of a teacher. If a teacher lectures, the authoritarian status is maintained.

Curriculum. The curriculum is rigid and very detailed. A teacher must “cover the content” and has little time for discussion, group work, or anything else. Teachers are not allowed to teach outside of the curriculum. They are monitored by inspectors.

Serbessa (2006) lists obstacles that must be overcome if student-centered methods are to be used in Ethiopia. These include the traditions of teaching and bringing up children. Other obstacles include the lack of resources, such as institutional and learning resources, teacher expertise, curricular materials appropriate for active learning, and student experience in actively participating in the teaching and learning processes.

Student-centered methods encourage students to be active and to debate, even to criticize. In Ethiopian culture, however, children are taught to fulfill, without question, any request made by an older person. Attainment of obedience and politeness are the overriding goals when bringing up children. The traditional forms of education and upbringing do not facilitate employment of active learning (Serbessa, 2006). In the work of Serbessa (2006), 89.2% of teachers and 89.7% of students considered that student roles were limited to listening to lectures, note-taking, and responding to questions when they were posed. Children who are brought up to be silent unless addressed, consider talking without being asked as impolite and disrespectful (Serbessa, 2006).

Gemeda, Fiorucci, and Catarci (2013) recently explored the nature of professional development in Ethiopian secondary schools from the perspective of teachers. The results were similar to those of the present work. Teachers feel they are forced to implement the governmental program. CPD had been planned at the ministerial level:

We don't have any say in the direction and content of the programme. We don't have a clear idea about the CPD. – We are simply told, "do it because it is useful." We don't have any option expect to accept it. (Gemedda et al., 2013, p. 7).

As we see, professional autonomy of teachers in Ethiopia is very low. Teachers are told what to teach, how to teach and what material they should use. They do not have freedom to choose the content of lesson, because they have to cover the content of their subjects and curricula is extremely rigid. Teachers are not allowed to discuss certain issues, such as political questions, with the students, if the teachers' views do not represent the ideology of the government. Follow-up by government is strict and constant.

According to Hargreaves and Fullan (2012, 82) restricting teachers' autonomy drives them to compete instead of collaborate, and makes the work of teaching unappealing. Pearsons and Moormaw (2005) showed that as general teacher autonomy increased so did empowerment, professionalism and job satisfaction in all teaching levels. They claim that if teachers are seen as professionals, they should have the same kind of freedom to prescribe the best treatment for their students as doctors or lawyers do for their patients and clients. Autonomy of Ethiopian teachers is not yet researched maybe because it is one of the sensitive issues teachers and especially principals are not willing to discuss due to political reasons.

Conclusions

As we know, reasons for the poor implementation of child-centered methods in practice are large class sizes, a centrally designed curriculum, and an authoritarian culture; these do not support use of student-centered teaching methods. Before such pedagogy can be used effectively, structural changes are necessary. If student-centered teaching methods are demanded, curriculum reform is imperative. Curricular materials should be re-written to involve activities processing the new material and linking that material to what a student already knows. Tasks should be related to challenges in the real world and be contextually meaningful. They should not simply emphasize facts, but offer opportunities for self-assessment, peer discussion, and teacher feedback (Serbessa, 2006).

The overall aim of CPD is to improve achievement levels of Ethiopian students (MoE, 2008, p. 15). Teaching has but one goal: good annual test results that yield a good ranking. Does the new method simply seek to have students learn curriculum better or to develop thinking and problem-solving skills? From the example of India, we can see that child-centered pedagogical reforms do not always provide higher quality teaching (Sriprakash, 2010). Similar tensions between competence pedagogic ideals and the conditions and cultures of schooling have been reported in research beyond the Indian context (Vavrus, 2009; Barrett, 2007).

Can student-centered teaching pedagogy simply be transferred from country to country? Or would it be better to develop a more contextualized culture-based teaching method? Ethiopia, like other African countries, has vast cultural and natural resources that could be used in teaching. For example, outdoor education is still very unfamiliar in Ethiopia, but it could certainly be used in a rural context. One teacher at Kambata School had produced a leaflet about traditional ways to make food from the false banana tree. He said: "Many of our students do not know how to make our own traditional food. Now we can use this material also at schools." (male-teacher, upper level.) This is a good sample of how to use cultural context in teaching.

Smaller teacher-student ratios would enable working group discussion. Active learning requires that classrooms have enough space to allow appropriate seating arrangements. The current class size exceeds 80 students in many rural schools (Serbessa, 2006). Dialogue and discussion during class are not part of the present teaching culture because their use challenges traditional culture norms, whereby a teacher is considered to be an authority. Contextualized and applied approaches to learning and teaching, and co-designing of teaching with teachers may produce more sustainable results.

Teachers will lack commitment to student-centered pedagogy if they feel this is simply a new governmental demand that they are forced to obey. Pedagogy should be developed with input from all stakeholders in an open and transparent environment (Negash, 2006, p. 51). Teachers are torn by two disparate requirements: they are to develop new teaching skills and at the same time fulfill the demands of government. These challenges place great pressure on teachers. “The teachers try to satisfy the interest of the government policy and their own career” (Male-teacher, upper cycle). Teachers should be given appropriate training, not only on facts, but also about active learning methods. Before they can implement such methods, they should experience an active learning situation. Simply knowing a method does not mean that the method can be used without practice and guidance.

There is a need to highlight the voice of rural teachers. Ethnographic research could be a suitable tool for policy makers to provide insights into how policy might be better designed to meet the needs of all teachers, not only urban teachers. Certainly there is a need for policy makers to know more about the lives of rural teachers. (Buckler, 2011). Action research is widely known among Ethiopian teachers. It could be a suitable tool to create and test new, active and culturally contextualised teaching methods, not by foreigners or policy makers, but Ethiopian teachers themselves.

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