

Teacher preparation for the digital literacy applying ubiquitous learning

EXTENDED ABSTRACT – *NOT PROOFREAD YET*

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General Terms

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Keywords

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ABSTRACT

In this paper, we discuss the digital literacy and initial teacher education and reflect on the current state of Web education and digital literacy teaching in initial teacher education in Slovenia. The literacy context is discussed following with the outline of the course Educational Technology. The aim of the course Educational Technology for pre-school teachers and classroom teachers is to develop teacher

students' digital literacy and prepare them for the efficient integration of ICT in their teaching, which will in turn influence learners' digital literacy and competence for active engagement in a culture of participation. Web education teaching methodology with the focus on instructional design, learning resources and high-order learning outcomes are discussed. The affordance of mobile technology foster ubiquitous learning which was integrated in teacher education curriculum. The notion of tools in learning and literacies is discussed in transition from traditional written culture to digital culture. Integrating mobile learning converge three important dimensions which underlines development of the digital literacy: the technology dimension of wireless portable mobile providing instant access, the social dimension and the learning behaviours dimension. The survey was conducted to examine undergraduate student-teachers' attitudes of applying the ubiquitous education and developing the digital literacy through the integration of mobile learning.

The literacy context

The set of traditional literacies of writing, reading and computing is facing shifts with the development of information and communication technology. The teacher initial education and continuous professional development is facing major changes in all domains and especially in the domain of teacher's competences. Due to rapid technological developments, the competences for integration of ICT in teaching and professional learning are contested. With the information society emerged the information literacy concerning searching, accessing, comprehension, critical evaluation and the informed use of data and information [1]. Computer literacy which is more concerned with the computer technology and how to operate it [2] was followed with the elementary school curriculum objectives on the technology, operation of technology and technological concepts and programming including problem solving skills [3]. ICT literacy refers to applying information communication technology in all aspects of human life [4]. ICT literacy is defined as information literacy *"applying technology to communicate and use information resources highlighting critical assessment of information [5]"*. The ubiquitous technology and rapid development is contesting definition of ICT literacy, with Web 2.00 the shift has been conducted from manipulation with information and consumption to production and sharing information [6].

Digital literacy is defined as a mix of technical proficiency and meaningful engagement in digital environments [7], web environments and networks. Digital competence involves problem solving, communication, managing information, collaboration, creation and sharing of content, and knowledge building [8]. Competences for creative expression and online production are required, both in school and in the work environment [9]. Digital literacy requires competences for engagement in web based environments combining modes of representations with multiple sign systems exploiting affordance of web technologies, multimodal literacy embedded in a social systems [7] and is required for autonomous participation in a networked society where participation means production. The capability to participate includes designing and creating texts using multimodal web resources to present knowledge and communicate is general requirement for all [10].

The notion of tools in learning [10] moving from traditional written culture of pencil and paper technology to digital technology is contesting cognition and learning. Integrating mobile learning converge three important dimensions which underlines development of the digital literacy: the technology dimension of wireless portable mobile providing access, the social dimension and the learning behaviors dimension. Transforming literacy from oral to written culture affordance of cognition has evolved [11]. Digital literacy affordance of cognition due to manipulation with mobile devices are characterized with:

- touch interaction
- instant access to information
- hyperconnectivity and networking
- dynamic interactive and multimodal representations facilitating spatial awareness.

Mobile technology affect social practices of students and the way how students learn ubiquitous in in day-to-day activities. Short learning evens are typical and multitasking. The apps are becoming a wide spread learning resources [12]. Literacy incorporates technical skills and social practice which interact and influence each other. Ubiquitous technology facilitate new social practices and both lead and set the literacy requirements.

With the ubiquitous mobile technology which transforms social practices and preferences of young generations, the teacher has to consider teaching and learning approaches aligned with preferences of students and digital literacy *“grammar of spelling of the digital [13]”*. In this paper the student-teachers’ digital literacy is discussed outlining the curriculum and approaches applied in initial teacher education. The study presents undergraduate student-teachers’ attitudes of applying the ubiquitous education and developing the digital literacy through the integration of mobile learning. The aim of the course Educational Technology for pre-school teachers and classroom teachers is to develop teacher students’ competences and prepare them for the efficient integration of ICT in their teaching, which will in turn influence learners’ digital competence for active engagement in a culture of participation.

Teacher’s ICT literacy in Finland was in 2006 defined with the pedagogical competency and the use of ICT tools on a three levels, the first consists of pedagogical use of ICT and use of basic software for text edition, email; the second consisting of more advanced pedagogical knowledge of designing and developing learning resources and the third consists of multimedia, distance learning systems, networking, programming, information systems for administration, ICT supported research and innovation. Finnish researchers are indicating in the year 2006 that 10% of teachers achieves the third level of ICT competences [14]. With the development of Web 2.0 the third level has become the basic requirement for all teachers. The use of ICT in teaching and learning for high order learning outcomes is a predominant concern. The ICT is applied in teaching for examining concepts, solving problems, creativity and innovation [15]. Moving away from a pencil and pen technology to digital technology, students need digital competence as enabler of their literacy. The development of digital competences has to take place in cross-curricular context and according to TPACK model providing integration on three levels: technology, pedagogy and content knowledge [16].

Digital literacy to facilitate high order learning objectives: The curriculum structure

Competences developed within the course Educational Technology for pre-school teachers and classroom teachers are connected with the objectives of pre-school and primary school curricula, educational process and the interactions and experiences from which children learn. The course covers information communication technology and media in teaching and learning, underlined by concepts of participatory culture, networking, and creative expression and production, underlined with collaboration and sharing. Competences are needed for participation in digital societal forms and media, and the gap in participation is caused more by the lack of competences than by a lack of technology [17]. The findings of research on different educational levels indicate that younger generations who have grown up using digital technologies lack adequately developed competences for online participation. These are defined as creative expression, problem solving, collaboration and

sharing [9]. The use of computers and the Internet is part of the world of young people who are early adopters of novelties and advances - especially in their spare time [18]. Diffusion between youngsters is faster than between teachers [19]. The lack of ICT application and their alignment with curriculum objectives towards digital literacy is maintained if teachers are not equipped with digital literacy and competences for ICT supported teaching [20]. Web education teaching methodology, instructional design and learning resources are examined with regard to achievement of high-order learning objectives.

Survey on student-teachers' attitudes

The TPACK model was applied as teaching approach to provide authentic context for student-teacher learning. Focus was on examination of child' day-to-day practices when using mobile technology and web. The role of school and teachers is to inform parents and children and to facilitate digital literacy, and the appropriate implementation of the mobile technology in day-to-day activities. Learning at the stage of early learning is based on creative activities, whole body movement, play, and collaboration. Learning is processed with concrete non-symbolic representations of concepts. Manipulation of concrete physical objects and various materials is combined with visual representations. According to Piaget [21], children's developmental level in pre-school and during the first period of primary school is defined as the level of concrete operations and according to Bruner [22] it is processed through action in his enactive stage. The computer provides approaches and techniques of expression and creation, play and collaboration and facilitates visualization and virtual representations. Kress [23] highlights that web based learning provide efficient and effective access to multiple modes of representations and therefore influence thinking. The creation, representation and communication of meanings is multimodal [23].

The survey was conducted to identify student-teachers' attitudes. Findings which will be presented in a paper identify students' preferences and behaviours in mobile learning.