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Contents of digital literacy from the perspective of teachers and pupils

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Abstract

This paper deals with the contents of digital literacy education on the primary and lower secondary schools from the perspective of teachers and pupils. It is based on the results of a relatively large exploratory survey, which involved more than thousand schools. This project aimed to improve specification of curriculum, processes and organizational aspects of students' digital competence development and to determine the current state, structure and orientation of development of digital literacy in primary and lower secondary schools. This paper analyses selected results of this research project and concerns the content and concept of informatics subjects in primary and lower-secondary school and their evaluation by teachers and pupils.

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1. Introduction

The interpretation of the concept of digital competencies and digital literacy has undergone long-term development and its contemporary appearance is characterized by complexity and by focuses not only on technology skills but also cognitive and attitudinal components of personality.

The development of digital competence, whether implemented in primary school, in other forms of initial education, or even further education, is targeted at the entity of the respective educational impact and the corresponding level of digital literacy. Generally speaking, competencies are understood to be an integrated, portable and multifunctional set of knowledge, cognitive and practical skills, attitudes and values representing the potential to perform effectively in a given context, which can be utilized as a whole to enable efficient conduct of a given individual (OECD DeSeCo, 2005).

Building on the explicit incorporation of Digital Competence among key competencies for lifelong learning (European Parliament and the Council, 2006) and its characteristics, additional research activities which focused on

more precise specifications of a given competency and its components were also conducted. Undoubtedly, one of the most significant of these studies was the Digital Competence Project (DIGCOMP), which was carried out by the Institute for Prospective Technological Studies in Spain an institute of the European Commission - Joint Research Center (Ferrari, 2013). The DIGCOMP project was based on the understanding of key competencies such as the ability to use relevant knowledge and skills with responsibility and autonomy, while utilizing a creative, critical and intercultural approach in relation to work, leisure and education (Ala-Mutka, 2011; Ferrari, 2012).

A report from the DIGCOMP project presented a general framework for relevant key competencies and their related sub-competencies. More specifically, it presented the following 5 areas and 21 sub-competencies that characterize skills and attitudes in terms of necessary knowledge (Ferrari, 2013):

1. Information: 1.1 Browsing, searching and filtering information; 1.2 Evaluating Information; 1.3 Storing and retrieving information.
2. Communication: 2.1 Interacting through technologies; 2.2 Sharing information and content; 2.3 Engaging in online citizenship; 2.4 Collaborating through digital channels; 2.5 Netiquette; 2.6 Managing digital identity.
3. Content creation: 3.1 Developing content; 3.2 Integrating and re-elaborating; 3.3 Copyright and Licences; 3.4 Programming.
4. Safety: 4.1 Protecting devices; 4.2 Protecting personal data; 4.3 Protecting health; 4.4 Protecting the environment.
5. Problem solving: 5.1 Solving technical problems; 5.2 Identifying needs and technological responses; 5.3 Innovative and creative use of technology; 5.4 Identifying digital competence gaps.

In terms of digital literacy, the latest and most comprehensive conceptual requirements (i.e. necessary knowledge, skills and attitudes that students should acquire) identified by the DIGCOMP project include the following 21 subareal competencies (Ferrari, 2013): Browsing, searching and filtering information; Evaluating Information; Storing and retrieving information; Interacting through technologies; Sharing information and content; Engaging in online citizenship; Collaborating through digital channels; Netiquette; Managing digital identity; Developing content; Integrating and re-elaborating; Copyright and Licences; Programming; Protecting devices; Protecting personal data; Protecting health; Protecting the environment; Solving technical problems; Identifying needs and technological responses; Innovative and creative use of technology; Identifying digital competence gaps.

2. Aims and methods of the research

The development of digital literacy of children in schools focused research project Czech Science Foundation Children's information technology competencies and their development at primary and lower-secondary schools, which was carried out at the workplace of the petitioners of this project. The research focused on the issue of informatics education at primary and lower-secondary schools in the Czech Republic and its target group consisted of teachers of informatics subjects, and their pupils.

The main objective of the project was to recognize the current state, structure and orientation (in terms of aspects pertaining to curriculum, processes and organization) of digital competence development in children (i.e. building relevant levels of digital literacy in formal education), and identify key features and processes of digital competence development in schools and contribute to improvements in the quality education in an information society – especially the process of digital competence development in children in schools, which will have an impact on the labor market, effective lifelong learning, and life success in a given developmental stage of an information society.

The subject of research was broken down into five areas which focused on the: (a) characteristics of informatics learning activities, (b) content of informatics learning activities, (c) current state and concept of pupils' information technology competencies development, (d) structure of teachers' ICT competencies, and (e) implementation of information technology competencies development into learning activities and educational school environment (Štípek, Rambousek & Procházka, 2013a).

In addition to theoretical methods employed during an extensive exploratory survey, the project also used empirical methods of a quantitative and qualitative nature. The questionnaire method was used as a primary empirical research method and it was based on an interactive graphic questionnaire for teachers of informatics

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