

SELF-EVALUATION OF SKILLS IN THE AREA OF ICT IN 1ST LEVEL ELEMENTARY SCHOOL TEACHERS: PARTIAL RESEARCH RESULTS

Martin Skutil, Martina Maněnová, Marta Faberová

Abstract

The article presents research aimed at exploration of information and commutative technologies at primary schools in the Czech Republic. The research was aimed at work with ICT of the 1st level elementary school teachers and on self-evaluation of work skills with ICT. Younger teachers evaluate themselves better than older ones from the viewpoint of self-evaluation of skills. According to their opinion, teachers master a text processor best, followed by a programme for creating presentations and the lowest skills are demonstrated in work with a table processor.

Key words

ICT, primary education, use of computers in education, pre-gradual preparation, information literacy, self-evaluation.

1 Introduction

If we look around us we can observe that ICT are a part of most people's activities. Computer literacy is gaining in importance and is becoming a necessity for many branches of human activity. These new trends establish new demands on education (Šimonová, Poulová, Bilek, 2010).

The aim of education and appropriate decisions must be oriented so that potential information and commutative technologies are used to the maximum. Teachers should be prepared for this at universities that provide their pre-gradual preparation.

The ability to use a foreign language is mentioned most often in connection with work with information and commutative technologies. A necessary condition of successful accommodation to the forthcoming situation is that teachers master ICT on the required level.

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2 Theoretical backgrounds

Network literacy is characterized by the ability to identify, use and approach information in electronic form from the information net (McClure, 1994). The content of network literacy shifts in direction to work with the internet and the exploration of its possibilities (Woessner, 2004).

In 2002 the Bertelsmann Foundation and the AOL Time Warner Foundation arranged a conference aimed at literacy for the 21st century. The conference conclusion report states that a part of literacy for the 21st century is (Bertelsmann Foundation, 2002):

- **technological literacy**, which is described as an ability to use media (especially internet) as a means for an approach to information;
- **information literacy** (see above);
- **medial creativity** represents the ability to understand and take an active part in forming the content of media;
- **social skill and responsibility** means that man is able to recognize, which social consequences the publishing of information will bring and what influence these published pieces of information will have on the younger generation.

However, the concept of digital competencies has not been mentioned yet. Digital competences are a set of skills and abilities to solve problems by the use of ICT. It includes even the basic knowledge of ICT: use of computers for obtaining, evaluation, storing, forming and exchanging information and for communication and cooperation in the frame of nets, by means of finding information on the internet and judging their quality (Bunt-Kokhuis, 2009; Recommendation, 2005).

If we focus on the key concept of the present text, we understand self-evaluation in accordance with Nezvalová (2006) as “a process of systematic collection and analysis of information to form judgments about values based on solid evidence (Rogers and Badham, 1994. These judgements focus on identification of states of the achieved specific goals. They should therefore lead decision-making process in the field of development. Self-evaluation is often set into the context of the cycle of monitoring, analysis and revisions (Tippie, 1989).” This is confirmed by I. Roupec (1997) who says that self-evaluation is a systematically prepared and planned evaluation, directed according to predetermined criteria to predetermined objectives.

3 Methodology of research

The research is designed as a quantitative study using a questionnaire of its own design, which aims at describing the examined phenomenon from the perspective of teachers. The present results are based on previous researches, published for example in the publication of Primary Education Teacher in Relation to ICT (Maněnová, 2009).

3.1 Goals of the research

One of the goals of the research was to map the use of ICT by primary school teachers according to age, duration of pedagogical practice and education of the respondents in the area of ICT.

We ask research questions in connection with the following goals:

- What programmes teachers use at primary schools?
- What is the structure (are there some typical combinations of used programmes)?
- What is self-evaluation of teachers in the ICT area?
- What is evaluation of your own skills?
- Does any relation exist between self-evaluation in total and the evaluation of your own skill?

3.2 Research tool

A questionnaire as a basic research method consisted of three parts. The first one, beside the basic description data (age, sex, etc.), is aimed at the frequency of work with ICT both in learning and preparation for lessons. In this part of the questionnaire there are yes/no questions, scaled questions (used four or five level according to Likert), multiple choice questions and open-ended questions (Cohen, Manion, Morrison, 2005).

The second part of the questionnaire is aimed at work with office programmes, which, according to our research, are most often used by teachers when preparing educational materials, handouts for their lessons and pedagogical documents. The tasks in this part are general, displayed outputs could be formed in different office programmes (Microsoft Office, OpenOffice.org, etc.). For this reason the titles of concrete programmes do not occur in the questionnaire, just the general names for a given type of software do (e.g. text processor).

The third part of the questionnaire is aimed at the peripheral computer equipment. The content of this part is selected on the basis of practical experience and analysis of textbook contents. The Framework Educational Programme for Basic Education introduces, apart from other things, one of the expected outcomes is the pupils' ability to use basic peripheral computer equipment. Furthermore, pupils should be aware of basic maintenance problems of computers and be familiar with common problems with hardware and software. It means that teachers should know how to connect various peripherals and should not rely on chance or on the trial-and-error method. Knowledge tested in this part of the questionnaire is applicable even outside the profession of teacher (in practice, e.g. it is suitable to know which ports are available in the computer when choosing a computer keyboards,. Our experience also shows that one of the most frequent failures of computers in classrooms is connectors wrongly connected or unplugged (pupils often try to sabotage lessons in this way). In such a case the best way for teachers is to solve this small defect himself and not to need to seek help and lose time which is given for teaching.

3.3 Pilot research

The main objective of the pilot research was to test the questionnaire for teachers, created as a research tool for the frequency of ICT use in teaching and teachers' preparation of and their self-evaluation in the area of ICT. The pilot research was carried out from June until October 2008. The questionnaires were administered to a group of 22 respondents. Furthermore, the questionnaires were statistically processed and the reliability of questionnaire was determined. By use of Cronbach alpha coefficient, reliability of separate areas of the questionnaire was obtained in the range of 0.69–0.71. The questionnaire was discussed with some respondents and modified after discussion. The item "How often do you search information on the internet?" was changed to more concrete one: "How often do you search information for teaching on the internet?" Also, with regard to the respondent's attention and getting out of stereotype, the type of questions in a part of the questionnaire (Q9 – Q13) was changed. The objective of the pilot research was achieved and after the modifications the questionnaire was used for the research. Again, interviewed reliability reached level of 0.74 of the Cronbach alpha coefficient.

3.4 Research sample

The research was realized on teachers of elementary schools in the Hradec Králové and Pardubice regions. A total number of 700 questionnaires were distributed both by the students of the Pedagogical faculty at the University of Hradec Králové and by mail to separate incidentally selected schools in the above named regions. The questionnaire return rate was 74.1 %.

The research sample consisted of 519 respondents in total. From this number of respondents, 21 were men (4 %) and 498 (96 %) women, it corresponds with data, introduced by the Czech Statistical Office (Czech Statistical Office, 2009). The age of respondents varied from 20 to 65 years, length of practice was from 0.5 to 40 years.

Table 1: Basic data of descriptive statistics

	Age	Length of practice
Mean	33.6	9.2
Standard deviation	8.99	8.87
Minimum	20	0
Maximum	65	40
Mode	26	1
Median	30	5

It is important that teachers also have this technology, i.e. a computer connected to the internet, at their disposal at home. We found out that 95.8 % of respondents have access to a computer at home and 93.6 % of respondents have internet at home. If we compare our data with statistical survey published by the Czech Statistical Office (2009), it shows that our research sample is exceptional from the point of view of household computer equipment (Fig. 1). We must take into consideration that teachers mostly share a computer with other teachers at school and the preparation of lessons or schoolwork is done at home.

4 Results

The obtained data processed by NCSS 2007 STATISTICA 8 and Microsoft Excel 2007. For hypothesis testing the level of significance was set $\alpha = 0.05$.

It could seem that there is an unambiguous answer. Do teachers mostly use Microsoft Office programmes? With regard to the fact that in the re-

searched sample (group) there were teachers who took ICT lessons at universities and teachers who were educated in this area in courses, we expected a more colourful range of used programmes. It is true that Word, Excel, PowerPoint and Internet Explorer prevailed but even Firefox had its users. There is also an impact of affordability of digital cameras, i.e. wider usage of programmes for editing and filing photographs.

According to the realized investigation the most used programme amongst these was Photoshop. The question remains whether the users of this programme use it legally, as for several years Photoshop has occupied a top position among illegally used programmes on the international level (SIIA, 2009).

We also identified four typical groups of users (Fig. 2).

Fig. 1: Comparison of households equipped with a personal computer

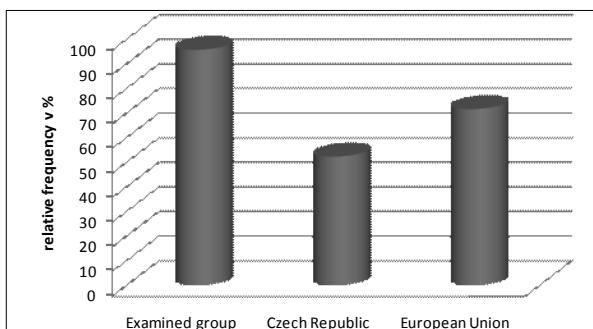
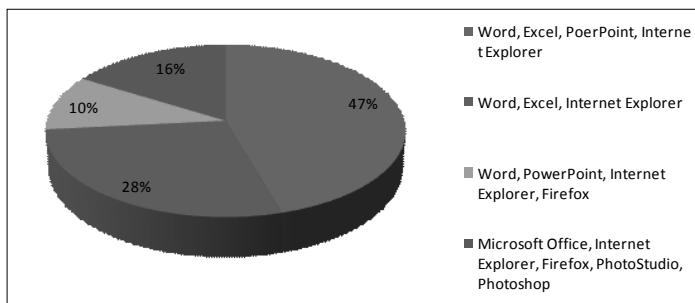


Fig. 2: Typical groups of users



One group uses the set of the Microsoft Office programmes and marginally Photoshop, the second group works most often with Word, searches information by means of Internet Explorer, minimally by means of Firefox (but users know it) and also works with Excel, but substantially less than with Word. The third group, in our opinion, is formed by typically older teachers who have been introduced in ICT use during their pedagogical practice; they write in Word, search information (Internet Explorer, Firefox) and prepare presentations for their lessons (PowerPoint). They search for material for presentations in other places as well as on the internet – they started to take pictures and edit them by means of computer (with Photoshop but marginally). The fourth group, according to our opinion, consists of young teachers, a few years after graduation, they work with the highest number of programmes (Microsoft Office, Internet Explorer, Firefox) and even make use of computer graphic (Callisto, CorelDraw, Picasa, PhotoStudio, Photoshop).

We also wanted to find out whether we could identify typical groups of users of certain types of programmes. From this viewpoint, we chose a non-hierarchical cluster analysis for elaborating data. Calculations were done for three, four, five and six clusters; a method of calculation was selected according to K-means with equable initialization, 11 variables (variables – programmes, which had a relative frequency less than 5 %, were excluded from the calculation) were selected for the analysis. This was only the case of orientation calculations as we were aware that cluster analysis is not ideal for bipolar variables. We analyzed the results of clustering with regard to the following reasons; four clusters were considered to be the optimal ones (see Skutil, Maněnová, Zíkl, 2010).

On the basis of the analysis, the respondents were divided into groups which could exist in reality. It is evident that working with the group of the Microsoft Office programmes and Internet Explorer prevails, but also the freely distributed Firefox has its representation. It is a pity that programmes distributed for free, e.g. Open Office and graphical programmes, are not used more often.

What is self-evaluation of teachers in the area of ICT?

The respondents expressed their identification with a verdict on a five-point scale. If they fully agreed with all the statements, the maximum possible score, which could be achieved, was 30. A higher average rate of consent was in younger teachers (21.8) than older one (19.4). After testing the null hypo-

thesis, we had the results of the Student t-test and Mann-Whitney test rejected ($t = 5.4197$, $Z = -4.6311$), we confirmed the hypothesis that self-esteem of older teachers is lower than that of younger teachers.

The question of the relation between self-evaluation and frequency of using ICT seemed unambiguous to us. We supposed that those with higher self-evaluation (higher score) would use ICT more often as they master technology better, can use it. The correlation coefficient was relatively low (0.386). After testing the closeness of relations we could conclude that our presumption was correct.

What is the evaluation of one's own separate skills?

Writing text on computer is probably the most widespread activity and even self-taught people could work with the text editor quite quickly. According to our research LearnInd CTS (Korte, Hüsing, 2006), who compared approach to and use of ICT at schools within Europe, about 90 % of European teachers feel confident about their work with a text processor; about their work with programmes for presentations it is only the case of 57 % of teachers. Our research showed that in other cases (work with a table processor, work with a programme for creating presentation and the basic plugging of connectors) younger teachers reach better evaluation. The fact that younger teachers evaluate themselves better than the older ones is, according to our presumption, effected by studying at universities where they already worked with ICT. We even took into consideration the type of education in the area of ICT. The unequivocal difference among teachers, who had been introduced in ICT at universities and in other courses, and the other two groups, was proved. It was confirmed that the items of the questionnaire concerning skill evaluation reflects education in the area of ICT (at universities and in courses) and at the same time one of the principles of learning. Repeating is not only fixation of acquired matter, but it means development and improvement of the acquired results. Repeating should be carried out in correspondence with certain rules. It is, e.g., systematic, activity, structuralisation, motivation, respecting the rules of mental hygiene (break, changing activities, curve in psychic performance, etc.).

5 Conclusions

We were interested in programmes which teachers work with, what is the structure of these programmes, what is the frequency of ICT use by teachers

and what is self-evaluation and evaluation of separate skills in the area of ICT. Primarily, we aimed at answering questions.

As the research result shows, it could seem that there is an unequivocal answer. Do they use mostly the Microsoft Office programmes? With regard to the fact that there were teachers in the research sample who passed ICT at university, and teachers who were trained in courses, we expected a more colourful variety of programmes used. It is true that Word Excel, PowerPoint and Internet Explorer programmes prevailed but even FireFox had its users.

According to the realized research, Photoshop is the most often used programme from all of them. The question remains: do these users use this programme legally? For several years already Photoshop occupies a leading position among the illegally used programmes on the international level (see Korte, Hüsing, 2006).

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Contact

Mgr. Martin Skutil, Ph.D.; martin.skutil@uhk.cz
 PaedDr. Martina Maněnová, Ph.D.; martina.manenova@uhk.cz
 Doc. PhDr. Marta Faberová, CSc.; marta.faberoval@uhk.cz

The Institute of Primary and Pre-primary Education
 The Faculty of Education, University of Hradec Králové
 Rokitanského 62
 500 03 Hradec Králové