Computers in Human Behavior xxx (2014) xxx–xxx

Contents lists available at ScienceDirect

Computers in Human Behavior

journal homepage: www.elsevier.com/locate/comphumbeh

Factors influencing acceptance of e-learning by teachers in the Czech Republic

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ARTICLE INFO

Article history:
Available online xxxx

Keywords:
E-learning
Acceptance
Teacher
Teacher training

ABSTRACT

The goal of this study was to explore the factors which impact the acceptance of an e-learning course by teachers of elementary and secondary schools in the Czech Republic. The survey involved 228 teachers from 68 different primary and secondary schools. These teachers took part in some of 16 different asynchronous on-line courses aimed at the use of modern technologies in education. It was found that the factors with major impact on the e-learning course acceptance include the voluntary participation of teachers in the course and the positive expectations held before the course start ($p < 0.001$). Working through the course on one's own and the subjective evaluation of various aspects of the course plays an important role as well ($p < 0.001$). The factors which had no statistically significant impact ($p > 0.05$) included the teacher's age, gender, type of school, prior experience with e-learning, individual habits in terms of completing voluntary tasks and taking notes, the involvement in discussions during the course and the time schedule of the course. We conclude that considerable attention should be paid to the psychological aspects of further education of Czech teachers using e-learning.

1. Introduction

Digital technologies have become an inseparable part of both formal and informal distance education. Naturally, further education of teachers does not stand aside in terms of these trends. Digital technologies in distance education offer numerous opportunities (Bates, 2005). Yet, a number of questions arise regarding the changes in distance education caused by digital technologies and whether these technologies also erect barriers to the learners. This is why great attention has been recently paid to mapping the factors which govern the acceptance of digital technologies among the participants. Sophisticated structural models have been developed and tested to identify and evaluate the significance of individual factors. These models which are specific to e-learning are often based on more general technology-acceptance theories, such as the technology acceptance model (Davis, 1989) or the unified theory of acceptance and use of technology (Venkatesh, Morris, Davis, & Davis, 2003). Selim (2007) reported four basic categories of e-learning acceptance factors (instructor, student, information technology and university support), which comprises a total of 8 critical success factors (attitude towards and control of the technology, teaching style, computer competency, interactive collaboration, e-learning course content and design, ease of access, infrastructure reliability and effectiveness, support). Lee, Yoon, and Lee (2009) identified four basic categories (instructor characteristics, teaching materials, design of learning contents and playfulness) and stressed the importance of the perceived usefulness of e-learning as the intervening variable between the instructor characteristics and teaching materials and the e-learning acceptance.

To date, the research into factors impacting on the acceptance of e-learning has focused predominantly on students at higher education institutions. As shown in the meta-analysis of e-learning technology acceptance (Šumak, Heričko, & Pušnik, 2011), only limited effort was expended on exploring the way e-learning is accepted among teachers at primary and secondary schools. Nevertheless, the topic has been around, as evidenced by studies by Hu, Clark, and Ma (2003) and Pynoo et al. (2011). It is legitimate to assume that different factors will play their roles in various groups of learners. Particularly striking differences can arise in an environment where digital technologies in further education of teachers are a relatively new phenomenon, where a number of experienced teachers approach them with not only positive

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http://dx.doi.org/10.1016/j.chb.2014.11.018
0747-5632/

expectations but with some scepticism as well. The education and schooling in the Czech Republic, like in other post-communist countries, have been substantially reformed in recent years. One of the important elements of these reforms was the implementation of digital technologies in teaching and in further education of teachers (e.g. Zounek & Šeďová, 2009). The result is the ever-increasing use of courses delivered with the aid of digital technologies in the Czech Republic.

The suitability of digital technology-based and distance learning-based further education and development of professional competences of teachers has been verified through a number of studies: Adey (2004), Borko (2004), Barab, Kling, and Gray (2004), Cochran-Smith and Zeichner (2005), Whitaker, Kinzie, Kraft-Sayre, Mashburn, and Pianta (2007), Archibald, Coggshall, Croft, and Goe (2011), Kamakari and Drigas (2012) and DeMonte (2013).

In line with the UNESCO study entitled Teacher Education Guidelines: Using Open and Distance Learning (2002) we see the following arguments for offering further education courses for teachers of primary and secondary schools in the form of distance education and with the aid of digital technologies. Such courses:

- Reduce the need for face-to-face training of teachers, which strains the school system and removes the teacher-learners from their class.
- Shorten the time between learning a new teaching procedure and using it in the class.
- Alleviate problems with access to teacher training for teachers who face difficulties in commuting to ordinary education centres.
- Provide teachers with a direct access to pedagogical resources, information about the curriculum and methodological guidelines.
- Facilitate individual contact between the teacher, the tutor and other teachers and allow the study programme to be adapted to the needs of teachers.

Recently, attention was devoted to a composition of e-learning communities and its impact on effectiveness of e-learning (Huang & Wu, 2011; Isotani, Inaba, Ikeda, & Mizoguchi, 2009). Dascalu, Bodea, Lytras, Ordoñez de Pablos, and Burlacua (2014) proposed algorithm leading to optimization of composition of the multidisciplinary learning groups. It may be very interesting also in further education of teachers whose participants usually differ significantly in their background and interests. The research related to online teachers learning communities was reviewed by Wideman (2010). As digital technologies bring a relatively profound change to the field of further education, their acceptance among teachers is of great importance. It should be adequately addressed not only in terms of the course development but also in pedagogical research (Lawless & Pellegrino, 2007).

Therefore, the objective of this study is to explore, describe and explain the factors which govern the acceptance of digital technologies among primary and secondary school teachers in their further education. The study maps the situation in South Moravia, one of the major regions of the Czech Republic. The focus of the study also includes psychological aspects related to the motivation of teachers for taking e-learning courses and for collaborative learning in the e-learning environment.

1.1. Context

The PROEFES project (Environment for Sharing E-learning Resources and Knowledge among South Moravian Schools) is conducted jointly by Masaryk University in Brno and University of West Bohemia in Pilsen. It is funded from the European Social Fund and from the state budget of the Czech Republic. Under this project, educational courses were developed, which focused on the effective use of information and communication technology in instruction at primary and secondary schools. They were asynchronous on-line courses in the LMS Moodle environment which were developed by experienced e-learning specialists for a target group comprising teachers at primary and secondary schools of the South Moravian Region. Before the project started, a study was undertaken to analyse the needs of this target group. In the study, the content of the courses was outlined (working in the Moodle LMS, e-learning methodology, the use of ICT for teaching various subjects, general ICT skills and mobile technologies). All courses were developed in line with the recommendations by the Ministry of Education of the Czech Republic for developing e-learning courses for further education of teaching staff (Neumajer, 2013). While developing the courses, the authors relied on specialist information sources on adult education with the support of on-line technologies (Fee, 2009; Haythornthwaite & Andrews, 2011; Horton, 2006; Khan, 2005; Lytras (2010); Lytras and Pablos (2011); McVay Lynch & Roecker, 2007; Pablos and Lytras (2013); Vejvodová, 2004; Zounek & Sudický, 2012). The courses took 4–6 weeks of on-line study. At the start and at the end of the course, optional face-to-face tutorials took place. The on-line courses comprised a broad range of teaching activities, in which text-based study materials, videos and animations were used. In the courses, examples of best practice and case studies were included, as well as references to other (on-line) learning materials. The core of the course consisted of hands-on assignments and exercises (developing study materials individually in the Moodle LMS, creating multimedia presentations, preparing student activities with the aid of ICT and using e-portfolios in teaching, and others). The planned study time of a single course for a teacher was 42 h. In order to successfully complete the course, the participant normally had to take an active part in the course (e.g. in an on-line discussion), pass a test and/or complete a hands-on assignment or a project. The mandatory condition for completing the course was to fill in the final questionnaire.

Technical and methodological support was available for the school's installation of the Moodle task LMS and for the teachers who took part in the on-line courses. The teachers and their schools could thus immediately apply in their class the knowledge they acquired in the courses. They did not have to deal with technical administration of the Moodle LMS and they rely on the support provided in the project. It was thus much easier for the graduates from the course to use their new knowledge and skills in teaching.

2. Methodology

2.1. Procedure and instruments

The survey used a questionnaire which had been designed by a panel of experts from participating universities and verified in prior projects (Rohlíková & Vejvodová, 2011). The questionnaire was based on general principles of e-learning evaluation (e.g. Ehlers & Pawlowski, 2009; Khan, 2005). It also reflected specific aspects of the learners and local cultural traditions, including the features characteristic of the school system in the Czech Republic. The first part of the questionnaire focused on general characteristics of the respondents, on their e-learning experience and on their motivation and expectations of the course. The respondents filled this first part at the start of the course in the Moodle LMS (16 questions). The second part of the questionnaire contained questions exploring the behavior and the work of respondents during the course, their subjective evaluation of various aspects/elements of the course and their general acceptance of the course. This part was completed by respondent at the end of the entire course. It

Please cite this article in press as: Hrtoňová, N., et al. Factors influencing acceptance of e-learning by teachers in the Czech Republic. *Computers in Human Behavior* (2014), http://dx.doi.org/10.1016/j.chb.2014.11.018