
HYBRID LEARNING ENVIRONMENT IN HIGHER EDUCATION: CONCEPTUAL MODEL DIMENSIONS OF TEACHERS' COMPETENCE FOR E-LEARNING IMPLEMENTATION

Snježana Babić, Polytechnic of Rijeka, Croatia

Introduction

In the past few years, under the influence of different trends, many higher education institutions have made great efforts to improve the process of adopting e-learning, as well as to enhance its quality. Hybrid learning environment is particularly significant e-learning model which is in this paper defined as systematically modelled educational environment. Based on the requirements and characteristics of the immediate learning environment (students and educational content) and wider learning environment (institutions), the hybrid environment is the origin of choosing and connecting the learning activities in traditional classroom (with or without the use of technology) with online learning activities in virtual learning environment (e-learning system), in addition to the mandatory interaction with the aim of successful realization of the educational goal. In practice, different hybrid forms can be created and, according to Allen et al. (2007), the ratio between two environments is around 30% to 70% with obligatory online discussion. It is important to point out that virtual learning environments are built in different e-learning systems (institutional or cloud) that represent one of the significant information subsystems of numerous higher education institutions aspiring to become virtual universities.

For quality application of any e-learning model, Marshall and Mitchell (2004) emphasize the importance of maturity for every educational component and this paper puts the main focus on personal competence of higher education teacher for e-learning implementation as one of the key participants in the creation and execution of the educational process. Ehlers and Pawlovski (2006) claim that teacher competence is one of the important categories of quality standards in e-learning.

The implementation of e-learning technology in academic practice is not a trivial matter since it includes wide range of knowledge, skills and competencies in different scientific areas (pedagogy, technology, sociology, psychology, etc.), especially while creating hybrid learning environments. It is important to point out that the usability of virtual learning environments can be considered from the pedagogical and technical aspect (see Zaharias & Koutsabasis, 2011). Defining the factors related to teacher competencies for e-learning implementation poses a great challenge for many experts, and it is crucial since the existing vocation of higher

education teacher needs to be upgraded with certain qualifications from the field of e-learning. Furthermore, it is significant for *human resources management* in higher education institutions, i.e. for the development of new ways of *knowledge management*.

This paper will present a theoretical framework of literature research of factors concerning teachers' acceptance of technology and innovation in the field of e-learning and competencies for its application in higher education institutions. Based on the research findings, the dimensions have been singled out and described, as well as factors of conceptual model of teachers' competence for e-learning implementation in hybrid learning environment, as a foundation for future empirical studies and guidelines for teachers' professional growth. In the first part of the following chapter, a general notion of competency has been defined and characteristics of existing concepts and competence models have been pointed out. The chapter continues with the problem of defining the levels of competence for e-learning in hybrid learning environment. It all results in the definition of conceptual model dimensions of teacher competencies for e-learning implementation in hybrid learning environment, and key components and selected factors are specified within their framework.

Conceptual model dimensions of teachers' competence for e-learning implementation in hybrid learning environment

Competence models, concepts and frameworks

In general, according to *European Qualifications Framework* – EQF (see: <http://ec.europa.eu/eqf>) the term competence encompasses *the ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development*, while 2 attributes of personality are singled out: *autonomy and responsibility*.

Definitions of different competence models and concepts can be found in different areas, e.g. *Holistic model of professional competence* (Cheetham & Chivers, 1998), *general competence concept* (Weinert, 2001), in which the authors emphasize the importance of individual competence (e.g. *motivation, interest, commitment to work*) which makes a difference between individuals. The *Holistic model* (Cheetham & Chivers, 1998) stresses the importance of reflection which based on the self-perception or analysis of other participants in certain work environment can encourage the individual for professional advancement or career standstill. Therefore, according to the authors, the focus of analysis is on the implicit knowledge during the realization or after the realization of work. Weinert (2001) points out the importance of considering inner and outer motivation of the individual as an integral part of the competence model, while emphasizing the need to see the immediate *social context* (specific situation and task) and wider social context. According to the author, in the framework of wider social context, differences between certain *institutional models* come into focus during the *competence development*.

In e-learning, based on the existing competence models, Schneckenberg (2007; Schneckenberg & Wildt, 2006) defined the *Model for eCompetence of Academic Staff*, giving special importance to *e-context*, and *individual* and *organisational eCompetence*, while Ehlers (2007) defined competence concept as *quality literacy* putting emphasis on *professionalism*.

While examining the required knowledge, skills and competencies of higher education teachers for e-learning, it is important to consider *Qualifications frameworks in the European Higher Education Area* (QF-EHEA; <http://ec.europa.eu/eqf>), as well as learning outcomes – the results of educational process (e.g. during the teachers' education and specialization), as well as standards for certain professions.

Numerous associations and institutions related to the development of education quality, teacher quality and lifelong education (or teachers' professional development), define the competencies for certain professions in the sphere of e-education. In this paper, based on the researched literature, the competencies for e-learning implementation in hybrid learning environment will be analysed in the framework of *pedagogical* and *technological* dimension from the following standards, frameworks and programmes:

- “European Pedagogical ICT Licence –EPICT” (2012; <http://www.epict.org>)
- “Teacher ICT Competency Framework –eTQF” (2010; <http://etqfproject.ning.com>)
- “Guidelines for Professional Development of Online Teachers” (Southern Regional Education Board –SREB, 2009; <http://www.sreb.org>)
- standard “ISTE/NETS for Teachers” (International Society for Technology in Education –ISTE, 2008; <http://www.iste.org>)
- “The eLearning Competency Framework for Teachers and Trainer” (EIFEL standard , 2006; <http://www.eife-l.org>)
- “Common European Framework; uTeacher” (2005; <http://www.egger.ac/1docs/booklet2b.pdf>)
- “Blended Learning Certificate” (American Society for Training & Development –ASTD; <http://www.astd.org>)
- “Certificate in Blended Learning”, “Certificate in e-Learning Facilitation” and “Certificate in e-Learning Design” (Training Accreditation Programme – TAP; <http://www.tap-training.com>).

Problem – defining competence levels for e-learning implementation in hybrid learning environment

Generally, any form of learning process can be seen through a continuum, from *teacher-centred* education to *student-centred* education (Anderson, 2006).

In practice, *different models* of hybrid learning environment are found, where certain portion of differently structured VLEs are present. Even with slight rotation and shift of the components from the learning and teaching centre, VLE changes form and with it the role of key components: *higher education teacher*, *educational content* and *student*. However, this can

be considered on the level of individual learning activities (see Graham, 2006) and in that case, in one learning scenario the roles of all components can be altered in different ways.

In this paper, the role of teacher is extremely important (illustrated in Figure 1) and can be transformed from *instructor* or encourager and *facilitator* to *mediator*, i.e. arbiter in the process of learning and teaching (according to Anderson, 2006; Mentis, 2008). Thus, with even the smallest shift in any segment, in student-centred hybrid learning environment, the required level of teacher competence for e-education is increasing. It can be concluded that the level of required competence for e-learning implementation in hybrid learning environment can be considered in the continuum from rather low to high level of required e-learning competency.

According to relevant literature (Anderson, 2006; Mentis, 2008), the above mentioned continuum highlights 3 levels of hybrid learning environment, i.e. the context of characteristic ability to use virtual learning environments where certain teacher roles come into focus:

- On the first level, higher education teacher creates VLE which has the sole purpose of conveying educational content, and practice shows that the content is most often delivered in the original form (Word document, PowerPoint presentation, PDF and similar) with communication via e-mail or general information forum at the institution's website or within the e-learning system.
- By increasing the quantity of online group interaction between teacher and student, and by creating the so-called *online learning community*, it is possible to define the second key level of e-learning technology implementation. The teacher, through certain discussions and using the organizational tools, encourages and helps the student in the process of learning the content delivered in VLE.
- Getting closer to the student-centred learning and teaching model, teachers gradually lose their original/traditional role of the instructor and arbitrate in the creation of new knowledge (by student/individual or group of students) when working on contextual tasks. With the increasing shift towards the final point of the third level, the VLEs become *personal learning environments* (PVLE). In such environments teachers need to have high level of e-learning competence (according to Mentis, 2008; O'Leary & Ramsden, 2002; Mason, 1998; Cook, 1999).

Hybrid Learning Environment in Higher Education: Conceptual Model Dimensions of Teachers' Competence for e-Learning Implementation

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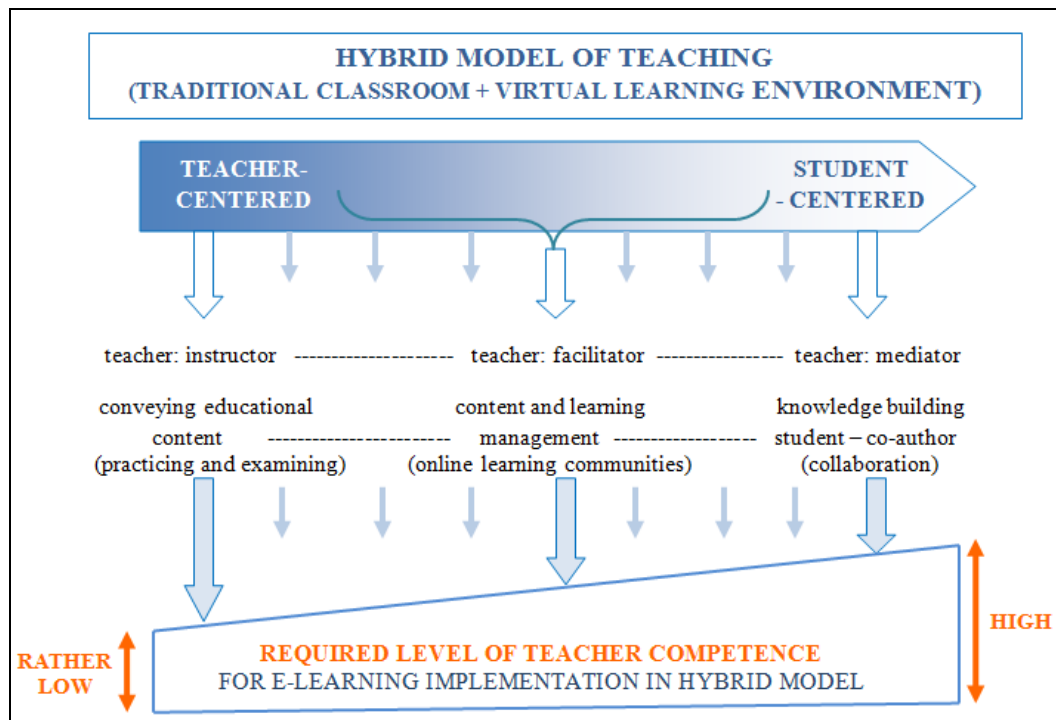


Figure 15. Levels of teacher competence for e-learning in hybrid learning environment

Conceptual competence model for e-learning implementation: dimensions, components and factors of e-learning adoption

It is evident from the analysis of existing competence theories and models that the key teacher competence for e-learning implementation, i.e. the so-called readiness to act (according to Weinert, 2001; Schneckenberg, 2007), includes *knowledge*, *skills* and certain *attitudes and values* connected with e-education. Furthermore, according to Ehlers (2007) among the main factors of teacher general competency for e-learning technology implementation are *responsibility* and *commitment to work quality*, related to the category of personal characteristics of higher education teacher.

According to the model by Cheetham and Chiversa (1998), higher education teacher develops the quality of professional work based on the *personal experience*, reflecting on effectiveness and teaching quality during the teaching process, as well as after. Therefore, great importance lies in the information gathered from other participants in the *educational environment* (students, colleagues within/outside the working place, management and others), as well as *self-perception*. Accordingly, the so-called *motivational factors* (*intrinsic* and *extrinsic*) are of crucial importance since they encourage the teacher to develop competence for e-learning implementation, i.e. for implementing the e-learning competence in hybrid environment.

In recent studies, and with the aim of better understanding of factors which influence the e-learning technology acceptance by higher education teachers, related to the e-learning implementation competence, various existing theories and models of technology and innovation acceptance have been used (e.g. *Unified theory of acceptance and use of technology*

– UTAUT, *Technology acceptance model* – TAM, *Innovation diffusion theory* – IDT, *Theory of reasoned action* – TRA, *Theory of planned behaviour* – TPB, *Social cognitive theory* – SCT, etc.; see Venkatesh et al., 2003) which are grouped in different categories (e.g. *individual, organizational and situational factors, beliefs and attitudes, social influence, intrinsic and extrinsic factors and similar*).

The relevant literature authors have identified *institutional factors* related to learning adoption (e.g. *strategy, technical infrastructure, support, time, encouragements, promotion, education, organizational learning and others*), factors related to teacher *attitude and values* (attitude towards technology is more prominent than the attitude towards pedagogy), *computer literacy, teacher personality* (the most common factors are: *anxiety and self-efficacy*), *factors related to teacher education* (*formal and informal education, learning communities, etc.*), *demographic characteristics* (e.g. *gender, department, title, years of service*) and other (see Babić, 2012).

In this paper, based on the literature researched so far, competence for e-learning implementation in hybrid learning environment will be considered in the framework of the following *dimensions: knowledge, skills and competencies; values and attitude towards e-learning; values and attitude towards e-education adoption; higher education teachers' personal characteristics; situational factors (course characteristics; student characteristics); institutional factors and professional development*.

Table 1 shows conceptual model dimensions of teachers' competence for e-learning in hybrid learning environment. Within the framework of individual components the key components and selected factors are singled out which influence the e-learning adoption in higher education.

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Table 5: Conceptual model dimensions of teachers' competence for e-learning in hybrid learning environment

Dimension 1. Knowledge, skills and competencies:	
Description: key competence component for e-learning implementation in hybrid learning environment	
<i>Components:</i>	<i>Description:</i>
ICT knowledge and skills	knowledge and skills required for working with general functions of information and communication technology.
General pedagogical knowledge	knowledge about learning and teaching theories (behaviourism, cognitivism, constructivism and similar), learning strategies, techniques, learning and teaching styles and other (see: Referral centre, Methodology and communication of e-education, CARNet).
Pedagogical use of ICT	to understand and recognize pedagogical potential of ICT (EPICT, 2012).
Hybrid use of ICT	to understand and be able to create hybrid educational programme and related virtual learning environment; to analyse and choose educational methods, as well as appropriate ICT (according to the definition of hybrid environment).
Online mentoring and moderating	to understand and be able to assess the use of learning techniques for encouragement, guidelines and helping students in VLE using different ICT with the aim of achieving formal learning outcomes (Salmon, 2004; Anderson, 2006).
Assessing knowledge using ICT	to understand the possibilities of ICT in the knowledge assessment and be able to determine the use of appropriate learning techniques (see: Anderson, 2006).
Dimension 2. Values and attitude towards adopting e-education:	
Description: key competency component for e-learning implementation; encourages changes in learning process; it is necessary to understand which values create certain positive or negative attitudes. Factors: general attitude towards e-education, relevance for work, output quality, ease of use, educational value of hybrid learning implementation.	
Dimension 3. Higher education teachers' personal characteristics:	
Description: intrinsic motivational competency component which influences the acceptance of technology and innovation, as well as implementation and development of knowledge, skills and competencies in the educational context. Factors: computer anxiety, self-efficacy, innovation, teaching style, commitment to work quality, voluntary e-learning implementation, sociodemographic characteristics.	
Dimension 4 Situational factors (course characteristics; student characteristics):	
Description: extrinsic motivational competency component which teacher uses to choose the educational model in the hybrid learning environment (according to: ISO/IEC 19796-1:2005, 2005), as well as revision of the existing models. Course characteristics: compatibility of e-learning technology with the course culture. Student characteristics: student competencies for using e-learning technology, preferred learning style.	
Dimension 5. Institutional factors:	
Description: extrinsic motivational competency component which teacher uses to choose the educational model in the hybrid learning environment (according to: ISO/IEC 19796-1:2005, 2005), as well as revision of the existing models. Factors: e-education support (technical, pedagogical and organizational); institutional readiness for e-learning (ICT infrastructure, strategies and politics, culture).	
Dimension 6. Professional development:	
Description: lack of training in e-learning implementation is one of the crucial obstacles with higher education teachers adopting e-education (Hew & Brush, 2007). Factors: community of practice (within and outside the university), educational model of obtaining e-education qualifications.	

Conclusion

Due to their organizational structure, numerous higher education institutions show special interest in implementation of hybrid learning environment in which teachers need to apply new knowledge, skills and competencies in e-education, while at the same time understand the way to integrate virtual learning environments into the traditional teaching approach.

The amount of the e-learning components present in the hybrid learning environment requires teachers to apply different levels of e-learning competencies which adds difficulty in defining the necessary qualifications and competencies of higher education teachers in the field of e-education (see Marshall & Mitchell, 2004; so-called problem of granularity).

E-learning is the innovation in higher education institutions and as such it comes across certain obstacles in the acceptance process by many partakers being influenced by numerous factors related to immediate educational context (personal characteristics) and wider educational context (e.g. institutional factors). In the literature it is possible to find great number of authors who, starting from different aspects, identified numerous factors that influence the adoption of e-learning, while using existing theories and models for accepting technology and innovation.

Based on the theoretical analysis, this paper singles out dimensions, components and factors of conceptual competency model for e-learning in hybrid learning environment. The model represents theoretical foundation for future empirical research.

Insufficient adoption of e-learning by higher education teacher is the potential problem of higher education institutions and educational systems on the whole. It is therefore reasonable to expect positive results of the proposed study for the following participants: *higher education institutions in the process of introducing and developing e-learning; institutions whose mission is to implement lifelong higher education programmes; teachers; institutions responsible for higher education quality; higher education teachers in their professional development; other organizations and individuals introducing new e-learning technologies to higher education institutions with the aim of improving the quality of e-education at higher education institutions, or in broader terms, with the aim of developing the knowledge society.*

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