ASSESSMENT OF COMPETENCIES OF ONLINE TEACHERS: PILOT STUDY AND SURVEY EVALUATION

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Abstract: *The adoption of e-learning in higher education institutions (HEI) is dependent on the level of e-teacher competencies and skills as well as on other factors like student characteristics and institutional environment. In this paper we present a conceptual model of competencies of online teachers in hybrid environments in higher education developed by the authors of the paper as well as a survey instrument for the assessment of the following skills and competencies with self-evaluation scales: ICT knowledge and skills; pedagogical competence to use ICT in e-learning; attitude toward the use of technology for e-learning; educational value of e-learning application; ease of use of e-learning technology in teaching; computer anxiety; self-efficacy; innovativeness; teaching style. Several other scales were developed for the measurement of institutional and situational factors. The results of our investigation into differences between users and non-users of e-learning in teaching are discussed along with the predictors of e-learning adoption. The findings of this pilot study have implications for teacher education in HEI as well as for the design of institutional environments that support e-learning.*

Keywords: *Teacher competencies, e-learning adoption, hybrid learning environment, higher education*

1. INTRODUCTION

The most common mode of implementation of e-learning at higher education institutions (HEI) is combining traditional learning in the classroom with online learning resources and activities. In this way the online or *virtual learning environment* (VLE) becomes a component of a blended learning or *hybrid learning environment* (HLE) in which the interaction among participants in learning takes place [1]. Such a hybrid learning environment poses specific requirements regarding the competencies of academic teachers which can contribute to quality in the realization of educational goals in VLE's [2] and are a necessary component of teacher education.

For HEI it is important to define the competencies of teachers who use VLE's. One European study identified three main competence-related roles of teachers in a VLE [3]: (a) pedagogical role, (b) social role, and (c) planning/design role. The role of 'e-moderation' in online teaching was also identified as a fourth key competency [4].

The concept of competence is interpreted differently by various authors in various practical or research fields (e.g. according to the holistic model of professional competence [5], or the general model of competence [6]). It must be noted that in the area of e-learning the concept of 'e-competence' was developed [7] which emphasizes the importance of *situational factors* (including the characteristics of the university course and of enrolled students) and *institutional factors* both of which have an impact on the competence of teachers for the implementation of e-learning.

The adoption of e-learning technology by teachers in HEI may be an additional factor that can affect the use of blended or hybrid learning besides teacher competence. Numerous authors have used various theories and models of technology adoption and innovation diffusion to identify the factors that influence teachers' adoption of e-learning. These factors can be grouped into the following broad categories [8]: teacher competence, personality, attitude and values, acquiring knowledge and skills, institutional and situational factors.

The main research goal of this paper is to develop a conceptual model of competencies of online teachers for application of e-learning in the hybrid learning environment of HEI. Such a model could be used to interpret the associations between factors of teacher competence to use e-learning and the factors of adoption of e-learning by teachers on the one side, with the level of use of e-learning at HEI on the other side.

In the continuation of this paper a brief overview of literature is provided together with a description of the components of the *conceptual model* of competence of online teachers in the hybrid learning environment. The theoretical analysis is followed by a description of research methodology and the results of the preliminary empirical research on the components of teacher competence for the use of e-learning in hybrid educational environments.

2. CONCEPTUAL MODEL OF TEACHER COMPETENCIES FOR E-LEARNING

According to recent findings from research in Spanish universities, teachers at HEI who have a greater experience in working with virtual learning environments also manifest a greater degree of overall pedagogical competence [9]. On the other hand, teachers at HEI who are adequately ICT skilled may still not be able to properly implement e-learning if they lack the understanding of its *pedagogical* potential [10]. In addition, the competencies of teachers are predictors of their innovativeness in the use of ICT in education [11].

With regards to *adoption of e-learning* it was established that teachers who perceive the learning management system (LMS) at their institution as easy to use also tend to perceive its usefulness more positively and have a greater intention to use it in their educational work [12]. Furthermore, teachers' prior experience of using ICT also has a positive impact, while computer anxiety negatively influences their attitude toward the use of e-learning [13].

A conceptual model of competencies of teachers in the hybrid learning environment of HEI is presented in *Figure 1*. This model was created on the basis of the authors' extensive analysis of related literature on e-learning.
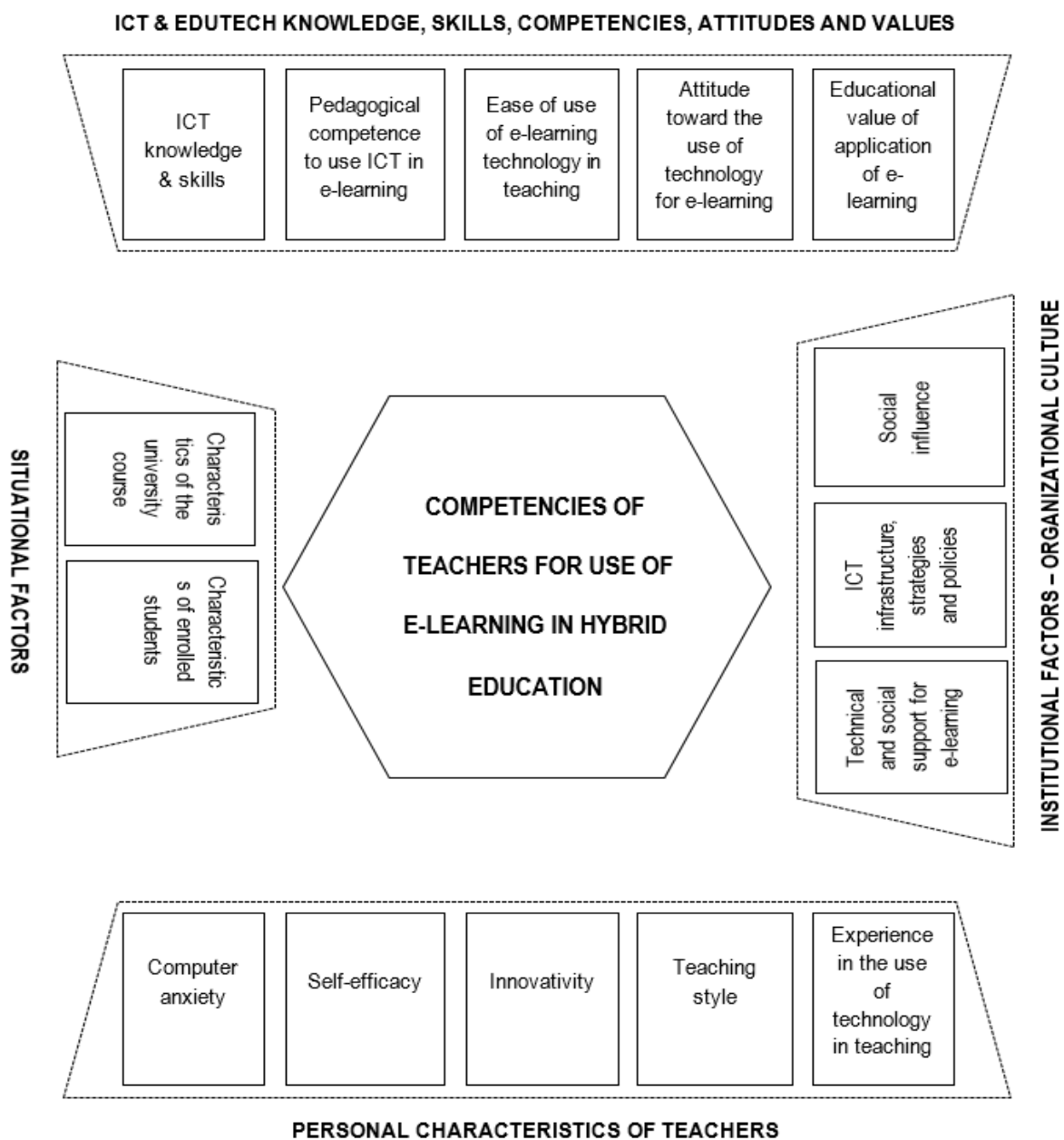

Figure 1: A conceptual model of competencies of teachers in the hybrid learning environment of HEI (*edutech* = educational technology)

The *conceptual model* that is presented in Figure 1 was designed to bring together various factors that may contribute to HEI teachers' competence to use e-learning in a hybrid environment which combines traditional lecturing in the classroom with the use of online resources and activities. One of the main starting points for the development of this conceptual model was the European Qualifications Framework – EQF (http://ec.europa.eu/eqf) which defines competence as a set of knowledge and skills, as well as the ability of the individual, including self-reliance and responsibility. Furthermore, the conceptual model was designed on the basis of theoretical analyses of various other models and theories of technology/innovation adoption [14], [15], [16], [17], [18], [19], [20], [22], [23], [24], [25].

Finally, some categories and indicators of competence for application of e-learning in HEI that were included in the conceptual model presented in Figure 1 were also selected on the basis of recently developed standards, frameworks and indicators that, among others, include:

- "European Pedagogical ICT Licence – EPICT" (http://www.epict.org);
- "Teacher ICT Competency Framework – eTQF" (http://etqfproject.ning.com);
- "Guidelines for Professional Development of Online Teachers" (http://www.sreb.org);
- "ISTE/NETS for Teachers" (http://www.iste.org);
- "The eLearning Competency Framework for Teachers and Trainer" (EIfEL standard, http://www.eife-l.org);
- "Common European Framework uTeacher" (http://www.egger.ac/1docs/booklet2b.pdf);
- "Blended Learning Certificate" (http://www.astd.org);
- "Certificate in e-Learning Design" (http://www.tap-training.com).

The conceptual model in Figure 1 is composed of 15 elements/factors that are organized into the following four categories:

1) Knowledge, skills, competencies, attitudes and values for the implementation of ICT and educational technology in hybrid HEI environments.
2) Personal characteristics of teachers.
3) Situational factors.
4) Institutional factors – organizational culture.

Each of these categories of the elements/factors which contribute to competence of teachers is elaborated in more detail in the next sections.

Knowledge, skills, competencies, attitudes and values for the implementation of ICT and educational technology in hybrid HLE environments

The likelihood for successful adoption and application of e-learning in the hybrid learning environment of HEI is increased when the teacher possesses adequate skills and attitudes regarding the use of ICT in education. In our conceptual model this category of teacher competence elements consists of the following five components that are exemplified below.

ICT knowledge and skills is an element or factor of competence that is related to the ability to use basic functionalities of information and communication technology (computers, networks, operating systems, applications software, online tools and services).

Pedagogical competence to use ICT in e-learning consists of knowledge, skills and abilities needed for the development of a hybrid form of educational process and virtual learning environments (VLE), including the selection and analysis of appropriate teaching methods, selection of suitable ICT and learning technology, evaluation of designed VLE's as well as online mentoring and moderating.

Ease of use of e-learning technology in teaching refers to the degree to which a teacher in HEI assumes that the use of e-learning technology will take place without much of his/her effort or constraint [14].

Attitude toward the use of technology for e-learning is related to the teachers' positive or negative perception of the use of e-learning in a hybrid educational environment [15].

Educational value of application of e-learning denotes the degree to which the teacher believes that he/she can improve the quality of teaching, realization of learning outcomes, quality of students' learning, etc. by the use of e-learning technology in hybrid environment [16], [17].

Personal characteristics of teachers

Various characteristics of teachers that are not directly related to their skills and attitudes may influence their readiness and competence to use e-learning in hybrid educational environments. The following components are more *conative* than *cognitive*.

Computer anxiety is a construct which denotes the level of unease or emotional stress which is felt by the teacher when he/she is confronted with the possibility to use technology for e-learning in a hybrid educational environment [18], [19].

Self-efficacy denotes the degree to which the teacher believes that he/she has the ability to use the e-learning technology in teaching [18], [15].

Innovativeness refers to the degree to which the teacher is ready to experiment with new ICT and introduce new technology and designs in his/her teaching activities [20].

Teaching style is associated with the perception of the teacher in HEI regarding his/her methods, strategies and techniques of teaching [21].

Experience in the use of technology in teaching denotes the intensity of ICT/internet use for teaching/learning.

The category *personal characteristics of teachers* also includes demographic variables like age, gender, teaching experience, educational background etc.

Situational factors

University course characteristics and characteristics of students are most commonly identified situational factors that may have influence on the realization of the teacher's knowledge and skills in the application of e-learning, as well as on his/her attitudes and values regarding its benefits or potential difficulty.

Characteristics of the university course is a variable associated with the degree to which the academic teacher believes that the use of e-learning technology is compatible with the requirements and content of a specific course [22].

Characteristics of enrolled students is a variable which denotes the degree to which the teacher believes that his/her students have knowledge, skills, ability and technical resources for the use of e-learning [23], [24], [15].

Institutional factors – organizational culture

Institutional factors (organizational culture) can be viewed as facilitators or inhibitors of teacher activity and their motivation to use e-learning technology. Even though internet access is available to all teachers at modern universities and to most of their students, the institutional and social environment may play a crucial role for the development of competencies and adoption of e-learning for those teachers who are not *early adopters* of educational technology. The three most relevant factors within this category of our conceptual model will be described in more detail below.

Technical and social support for e-learning is a construct which denotes the degree to which the teacher believes that he/she has the resources (guides, training, technical experts and advisors etc.) that are needed to develop and use a VLE in teaching [25], [15].

ICT infrastructure, strategies and policies is a component of our conceptual model that is associated with the degree to which the teacher in HEI considers that the use of technology for e-learning in a hybrid environment is compatible with the current ICT infrastructure, institutional strategies, policies and organizational culture [23], [24], [25].

Social influence is a variable which refers to the degree to which the teacher in HEI perceives that most of the people in his/her surrounding (students, management, colleagues etc.) think that he/she should use e-learning in a hybrid environment, as well as the degree to which he/she believes that the teacher's image or status at HEI would improve by the use of e-learning [23], [25], [22], [15].

Measuring the components of the conceptual model of competencies of teachers in the hybrid learning environment of HEI

A separate *assessment measure* was used for the measurement of each of the previously listed components of the *conceptual model* of competencies of teachers in the hybrid learning environment of HEI. For this purpose the scales for measurement of relevant constructs that were selected from literature were carefully redesigned to make them more suitable regarding the research goals of our empirical study. In the next section of this paper preliminary findings regarding the measurement characteristics of those scales are presented.

3. METHODOLOGY

A pilot study was conducted to empirically evaluate the *conceptual model of competencies of teachers in the hybrid learning environment of HEI* that is presented in Figure 1. The data for this pilot study was collected by a survey conducted among teachers in selected Croatian higher education institutions. Both users and non-users of e-learning were surveyed. Besides the intention to test the *conceptual model*, the goals of the pilot study were to evaluate the assessment instruments used in a survey, analyze the potential differences between the users and non-users of e-learning, and to identify the potential predictors of e-learning adoption at HEI.

Participants in the study

The pilot study was conducted in October and November 2014 at selected higher education institutions in Croatia. The choice of HEI was made on the basis of availability of their academic teachers for surveying (those HEI were preferred that were most convenient to access by the researchers at the time of the survey). A total of 114 surveys were collected that were correctly filled out by the respondents in the survey. As a result, two convenience samples of *users of e-learning* (N=65) and *non-users of e-learning* (N= 49) were formed for this pilot study. The basic characteristics of these two convenience samples are presented in Table 1. It must be noted that among the *non-users* there was a somewhat greater percentage of subjects of *male gender*. Also, only a small percentage (8%) of *non-users* had at least some experience with learning management systems (LMS) and none of them had created any kind of e-learning course. However, most of the *non-users* (86%) had used e-mail for interaction with their students.

Table 1: Basic characteristics of convenience samples of users (N=65) and non-users (N=49) of e-learning in pilot study

SURVEY SAMPLES CHARACTERISTICS	Users	Non-users
Male/female ratio (%)	29:71	43:57
At least some LMS experience	100%	8%
Use of e-mail for interaction with students	100%	86%
Average evaluation of personal e-learning competence	good	poor
Had created a simple e-learning course	49%	0%
Had created a well-structured e-learning course	22%	0%

The average age of subjects in both samples was about 40 years and most of them had between 10 and 15 years of work experience. Most of the surveyed subjects (about 80%) in both groups were teaching courses in the fields of social and humanistic sciences. Finally, almost 60% of the subjects in both groups had received a PhD title. The most frequent academic position in both groups was that of a teaching assistant (26% of users and 41% of non-users).

It can be concluded that the greatest demographic differences between the convenience samples of users and non-users in our study were that a somewhat greater percentage of *non-users* were of male gender and that 15% more subjects in the group of *non-users* held the position of a teaching assistant.

Procedure and instruments

As mentioned at the beginning of this section, the pilot study was conducted among subjects of HEI that were easiest to access by the authors of this paper. To obtain more representative results of the empirical research it would be better to have subjects from all universities in Croatia in proportion to the number of colleges at each university. Also, in the ideal situation the number of subjects from various academic fields (social, humanistic, medical, natural and technical sciences) would be proportional to the number of faculty employed in each of those areas. However, it is the opinion of the authors of this paper that for the limited purpose of this pilot study the selection of subjects in it was acceptable.

The subjects in the survey were anonymous and they voluntarily participated in the research. The survey was applied in the printed form and also as an online survey created by the Kwiksurveys online service (https://kwiksurveys.com).

The survey instrument consisted of two parts. In the first part the demographic data and the data about the use of ICT/internet were collected, as well as the data regarding the use of various technologies for e-learning by the teachers at HEI. The second part of the survey consisted of assessment scales (questionnaires) that were designed to measure various constructs/components of the *conceptual model of competencies of teachers in the hybrid learning environment of HEI* presented in Figure 1. The same survey instrument was used for the *users* and *non-users* of e-learning. However, the survey for the *users* also contained a list of items related to the levels of use of e-learning by the subjects in a hybrid educational environment of their HEI. The items in the assessment scales/questionnaires used a 1-5 point Likert scale for responses (1 – totally untrue; 2 – mostly untrue; 3 – neither true nor untrue; 4 – mostly true; 5 – totally true). The assessment scales were designed on the basis of similar instruments that were found in the literature (see *Section 2* of this paper for representative references) and most of them were adapted to the subject and purpose of our pilot study.

The assessment scales that were used in our pilot study and included in the survey instrument are listed in Table 2

together with the preliminary findings on the internal consistencies of those scales (indicated by the Cronbach alpha coefficient). It can be concluded from the data in Table 2 that almost all of the scales had good internal consistency (above 0.70), except for the scales *Innovativeness* (α = 0.68) and *Teaching Style* (α = 0.63), for which the Cronbach alpha was still considered to be *acceptable*.

Table 2: Number of items and Cronbach alpha coefficients for assessment scales used in pilot study (users of e-learning, N=65)

ASSESSMENT SCALE	Number of items	Cronbach alpha
ICT knowledge and skills	4	.89
Pedagogical competence to use ICT in e-learning	13	.92
Ease of use of e-learning technology in teaching	5	.92
Attitude toward the use of technology for e-learning	5	.91
Educational value of application of e-learning	11	.92
Computer anxiety	5	.94
Self-efficacy	4	.89
Innovativity	4	.68
Teaching style	5	.63
Experience in the use of technology in teaching	3	.91
Characteristics of the university course	3	.81
Characteristics of enrolled students	3	.84
Technical and social support for e-learning	5	.86
ICT infrastructure, strategies and policies	4	.80
Social influence	8	.79

It must be noted that for the sample of *non-users* (N=49) the Cronbach alpha coefficients of almost all scales were very similar to those that were calculated for the sample of *users* (the exceptions are the *Innovativity* scale with a much higher alpha of 0.84 and the *Teaching Style* scale with an unacceptable alpha of 0.43).

4. RESULTS AND DISCUSSION

In this section the differences between users and non-users of e-learning technology are investigated based on the components of the *conceptual model of competencies of teachers in the hybrid learning environment of HEI*.

Conceptual model and the differences between *users* and *non-users* of e-learning

Our convenience samples of teachers at HEI who were *users* and *non-users* of e-learning technology differed only in terms of the following two characteristics: there were proportionally more *male subjects*, as well as more *teaching assistants* in the group of *non-users*. However, the authors of this paper did not consider this difference as crucial for the goals of this *pilot study*. It must be emphasized that the *chi-square test* did not reveal any statistically significance between the groups of *users* and

non-users of e-learning regarding age, level of education, position at HEI, teaching experience, years of work at HEI, and scientific filed of university courses that they teach. When the distinctions in the use of ICT/internet and learning technology were observed, the following statistically significant differences between *users* and *non-users* were found (p<0.05 for the non-parametric equivalent of the Mann Whitney U and t-test for independent samples):

- *Length of use* of the following technologies was on average greater for the convenience sample of *users*: computers and internet at home; internet technologies in teaching like videoconferencing, webinars, online video, forum, etc.
- *Intensity of use* (hours per week) was greater by the *users* for the following technologies: videoconferencing, webinars, online video, forum, learning management system, online tests, multifunctional online tools, etc.

As expected, the previously presented summary of the results of data analysis confirm that teachers from the sample of *non-users* on average used the internet-based technologies both for private end educational purposes less than *users* of e-learning technology.

To test the components of the *conceptual model of competencies of teachers in the hybrid learning environment of HEI* that is presented in Figure 1 and elaborated in *Section 2* of this paper, the average scores of *users* and *non-users* of e-learning regarding their responses to the items of the assessment scale are compared in Table 3. For better distinction between the two groups, the average scores in the assessment scales which are statistically significantly different and by more than 20% higher in favor of the group of *users* of e-learning are written in ***italic/boldface*** in Table 3.

Table 3: The average scores for the samples of users (N=65) and non-users (N=49) obtained by the assessment scales that measure components of the *conceptual model* of competencies of teachers in the hybrid learning environment of HEI

ASSESSMENT SCALE	Average score (M)	
	Users	Non-users
ICT knowledge and skills	14.1	13.2
Pedagogical competence to use ICT in e-learning	*40.8*	*33.0*
Ease of use of e-learning technology in teaching	*19.4*	*14.0*
Attitude toward the use of technology for e-learning	*21.3*	*16.2*
Educational value of application of e-learning	*42.6*	*32.5*
Computer anxiety	*8.5*	*11.4*
Self-efficacy	16.6	14.0
Innovativity	*13.1*	*9.0*
Teaching style	17.0	16.2
Experience in the use of technology in teaching	*13.3*	*9.3*
Characteristics of the university course	*11.0*	*8.2*
Characteristics of enrolled students	*10.5*	*8.6*
Technical and social support for e-learning	15.3	14.5
ICT infrastructure, strategies and policies	12.34	11.0
Social influence	*24.09*	*19.5*

Regarding the data presented in Table 3 it must first be emphasized that for all of the measurement scales (except the *Computer Anxiety* scale) in our study the average scores were greater for the group of *users* of e-learning. In fact, the only scales in Table 3 for which the differences between average scores were not found to be statistically significant (p>0.05) are *ICT knowledge and skills*, *Technical and social support for e-learning*, and *ICT infrastructure, strategies and policies.* This result of our pilot study partly confirms the *conceptual model of competencies of teachers in the hybrid learning environment of HEI* regarding the choice of its components.

When the average scores for the assessment scales which were by *more than 20% higher* in favor of the group of *users* are observed (see Table 3), it can be concluded that, on average, the *users* of e-learning in our pilot study:

- were less computer anxious regarding the use of e-learning technology in teaching;
- had greater self-perceived pedagogical competence to use ICT in e-learning;
- found it easier to use the technology for e-learning in their teaching;
- had a more positive attitude toward the use of technology for e-learning;
- placed a greater value on the educational use of e-learning technology;
- were more experienced and innovative in the use of online technology for teaching;
- were more influenced by others in their institutional environment (teachers, students) to use e-learning;
- evaluated their university course as more suitable for the application of e-learning, and
- perceived their students as more capable and having better resources for the use of e-learning in their university course.

The relationship between the components of the conceptual model of competencies of teachers in the hybrid learning environment of HEI and levels of the use of e-learning technology

To investigate if the levels of the use of e-learning technology are associated with the scores obtained by the assessment scales that measure the components of the *conceptual model of competencies of teachers in the hybrid learning environment of HEI*, the following three items from the survey applied on *users* of e-learning technology were used:

- *L1:* "For e-learning I commonly use only the basic functionalities of the learning management system like publishing of information about the course, information about assignments and exams, etc."
- *L2:* "I commonly use the functionalities of the e-learning system and other adequate online tools for publishing educational multimedia content for the students (audio or video files and similar media)."
- *L3:* "In my work with the system for e-learning I apply adequate pedagogical principles and theories when using tools for collaboration and communication (wiki, blog, e-portfolio,etc.) which enable the students to cooperate in the creation of new knowledge."

The responses of the *users* (N=65) of e-learning technology to the previously listed items were provided by using a 1-5 Likert type scale (1 – totally untrue; 2 – mostly untrue; 3 – neither true nor untrue; 4 – mostly true; 5 – totally true). The first item (*L1*) indicated the lowest level of e-learning technology use and only the basic/elementary use of e-learning technology for academic teaching. The second item (*L2*) indicated a more than basic (administrative) level of the use of e-learning regarding the use of multimedia. Finally, the third item (*L3*) denoted the comparatively highest level of the use of e-learning technology with the application of pedagogical principles and use of collaborative (web 2.0) online tools and services.

According to the data presented in Table 4, there was no statistically significant correlation between almost all of the assessment scales and the item *L1* which is associated with only the *basic/administrative level* of the use of the learning management system. Furthermore, this item had a statistically significant <u>negative</u> correlation with the scales *Pedagogical competence to use ICT in e-learning* and *Innovativity*. On the other hand, the data in Table 4 indicate that most of the assessment scales had statistically significant correlations with items *L2* and *L3* which are associated with more than basic (L2) and advanced (L3) level of the use of e-learning technology. These findings seem to support the selection of the components of the *conceptual model of competencies of teachers in the hybrid learning environment of HEI*. In other words, according to the data presented in Table 4, we obtained initial confirmation of the potential factors (or predictors) of the level of the use of e-learning technology with the use of our rather small convenience sample of *users* of e-learning technology in our pilot study.

Table 4: Statistically significant correlations (p<0.05) of assessment scales that measure components of the conceptual model with items that indicate three levels of use of e-learning technology (*users* of e-learning, N=65; the scale *Teaching Style* was excluded from this table because of low Cronbach alpha)

ASSESSMENT SCALE	Items that indicate the level of use of e-learning technology in teaching		
	L1	L2	L3
ICT knowledge and skills	-	.24	.35
Pedagogical competence to use ICT in e-learning	-.45	.54	.62
Ease of use e-learning technology in teaching	-	.30	.32
Attitude toward the use of technology for e-learning	-	.37	.32
Educational value of application of e-learning	-	.41	.25
Computer anxiety	-	-	-
Self-efficacy	-	-	.18
Innovativity	-.37	.51	.44
Experience in the use of technology in teaching	-	.51	.33
Characteristics of the university course	-	.33	.36
Characteristics of enrolled students	-	.40	.34
Technical and social support for e-learning	-	-	.28
ICT infrastructure, strategies and policies	-	.34	.41
Social influence	-	.27	.23

If the data in Table 3 were also considered for interpretation, some of the assessment scales may be considered as potential predictors of e-learning adoption by HEI teachers since they can used to differentiate between *users* and *non-users* of e-learning. Still, these findings need to be confirmed on a more representative and larger sample of teachers at HEI.

When the correlations in Table 4 are observed in more detail it can be concluded that the highest positive correlation for assessment scales *Pedagogical competence to use ICT in e-learning* and *Innovativity* was found with item *L2* (indicator of use of multimedia in e-learning) and *L3* (indicator of using pedagogical principles and new technologies), whereas a statistically significant negative correlation was established between those two scales and item *L1* (indicator of only basic/administrative use of e-learning technology). Therefore the subjects of measurement of these two scales, compared to other elements in the conceptual model, seem to be the ones that are most closely associated with the competence of academic teachers to use e-learning in hybrid educational environments.

5. CONCLUSION

For the purpose of the pilot study that is presented in this paper a *conceptual model of competencies of teachers in the hybrid learning environment of HEI* was developed (see Figure 1) with a total of 15 components/constructs. These components of the conceptual model were selected on the basis of extensive literature analysis due to their potential influence on teacher competence to use e-learning as well as on their adoption of e-learning. For these components of the *conceptual model* assessment scales were created and in our preliminary study most of these scales demonstrated good internal consistency (see Table 2) measured by the Cronbach alpha coefficient (which was obtained both on convenience samples of *users* and *non-users* of e-learning).

With the assessment scales that were designed for our pilot study it was possible to differentiate between the sample of academic teachers who were *users* from the sample of teachers who were *non-users* of e-learning technology (see Table 3). Also, for the sample of *users*, the higher scores in these assessment scales were associated with indicators of higher levels of the use of e-learning technology (measured by specially designed survey items; see Table 4). These findings can be interpreted as a confirmation that the selection of components/constructs of the *conceptual model of competencies of teachers in the hybrid learning environment of HEI* was adequate as preparation for a larger study with a more representative sample of academic teachers.

The assessment scales that were used in our study manifested characteristics that make them potentially useful for similar research by other authors. Finally, it is the opinion of the authors of this pilot study that the *conceptual model of competencies of teachers in the hybrid learning environment of HEI* can contribute to current theoretical research of teacher competencies for e-learning adoption and use as well as to the design of continuing education of HEI teachers in that field.

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