SELECTED E-LEARNING ASPECTS AND STUDENT COMPETENCIES IN PUBLIC ADMINISTRATION EDUCATION: HOW WELL ARE THEY CORRELATED?

Damijana Keržič, Aleksander Aristovnik,
Nina Tomaževič and Lan Umek

University of Ljubljana

Slovenia

Abstract

In the present study, we explored the correlations between selected aspects of e-learning in the Moodle environment and the competencies students should acquire during their study. The research was based on two different questionnaire-based surveys conducted among Faculty of Administration students. In the final research, 41 students were involved. We found that the problem-solving competency is highly correlated with the adequacy of e-learning. Our findings also suggest a high correlation between the computer skills competency and the usefulness of e-learning.

Introduction

The development of information technologies has led to emerging applications such as e-commerce, e-banking, e-health, e-government, and e-learning. E-learning systems are one of the most important and advanced web-based applications in the education sector (Islam, 2016). Educational institutions at all levels invest in information systems to derive benefits like increasing the accessibility of education, improving self-efficacy, knowledge generation, cost effectiveness, learner flexibility, and interactivity (Alsabawy, Cater-Steel, & Soar, 2016; Sinclair, Kable, Levett-Jones, & Booth, 2016).

The importance of e-learning systems has been growing in recent years due to their considerable role in academia, industry, and society. This has prompted more scientific studies on the adoption and use of e-learning systems (Aparicio, Bacao, & Oliveira, 2017). Several studies have focused on either factors influencing e-learning (Hart, 2012; Mbarek & Zaddem, 2013; Novo-Corti Varela-Candamio, & Ramil-Diaz, 2013; Tarhini, Hone, & Liu, 2013; Upadhyaya & Mallik, 2013) or the consequences of e-learning, e.g., student performance (Fryer & Bovee, 2016; Hassanzadeh, 2012; Joo, Joung, & Son, 2014; Kassab, 2015; Saba, 2012) or their satisfaction with e-learning (Novo-Corti et al., 2013; Sun, Tsai, Finger, Chen, & Yeh, 2008; Umek, Aristovnik, Tomaževič, & Keržič, 2015), especially with its usefulness (Alsabawy et al., 2016).

Today's societies encounter globalization and modernization where everything is changing fast. Educational institutions face the challenge of educating their students to be well prepared to function in such varying and complex situations. Nowadays, mere mastery of knowledge is losing in importance while the skills learned by individuals and the competencies they acquire are ever more appreciated.

In the last 15 years, education has shifted towards a paradigm focused on students, learning, and competencies. In the context of Europe, the European Higher Education Area (EHEA) regards the concept of competency as the main element of the learning process, and students as the centre of the educational model (Fito-Bertran, Hernandez-Lara, & Seradell-Lopez, 2014). The transmission of knowledge is no longer the primary educational aim as students are expected to construct their own knowledge, search and process information, while the teacher is now considered a facilitator, collaborator, adviser, moderator, and coach in the learning process (Cantoni & McLoughlin, 2004; Ruiz, Mintzer, & Leipzig, 2006).

The new concept brought into classrooms is competency-based learning, ensuring students gain skills that seem important for their adult life and career. In this way, the academic world is coming closer to the professional world (Fito-Bertran et al., 2014). According to Gonzalez and Wagenaar (2003, p. 15), competencies are "…underlying characteristics of a person that are coincidentally related to good or excellent performance at work". The OECD (2005) describes competency as more than just knowledge and skills. It involves the ability to meet complex demands by drawing on and mobilizing psychosocial resources (including skills and attitudes) in a particular context. Many detailed definitions and potential uses of competencies can also be found in Klarsfeld (2000) and Kennedy, Hyland, and Ryan. (2009).

Since competencies are generally obtained during the educational process in different courses, they are related to the educational programme. Instead of credits-based education programmes, in the new competency-based concept, obtained skills, abilities and knowledge –competencies – are measured. Competencies can be divided into two types: specific and generic (Fito-Bertran et al., 2014; Gonzalez & Wagenaar, 2003; Kennedy et al., 2009). The former are specifically related to academic disciplines, with the particular knowledge of a thematic area. Generic competencies are those not necessarily related to a specific subject, such us critical thinking, problem-solving, decision-making, teamwork, logical thinking, finding and managing information, effective communication in the mother and at least one foreign language. Since competencies are generally obtained during the educational process in different courses, they are related to the educational programme. Instead of credits-based education programmes, in the new competency-based concept obtained skills, abilities and knowledge –competencies – are measured. the

The competency-based learning concept requires new and valuable learning tools to allow students to develop new skills and become active constructors of knowledge rather than just passive receivers of contents (Dunning, 2014; Fito-Bertran et al., 2014). In recent years, a noticeable change in higher education

institutions is the integration of various learning management systems to support the educational process. E-learning, generally defined as different forms of learning supported by ICT, emerges as this new learning environment and constitutes a new paradigm of modern education. E-learning allows students to learn in a more autonomous environment at their own pace and facilitates interaction between teachers and students without time or spatial restrictions (Barker, 2002; Sun et al. 2008). Dunning (2014, p. 66) concludes that "the delivery of a course, usually by the same professor over many years and in the confines of a classroom, is being overtaken by online delivery of the same course by multiple professors".

The purpose of the paper is to identify possible relations between students' opinions on specific aspects of e-learning and their assessment regarding the level of competencies they have acquired. The paper presents the strength of that correlation and suggests how the results could be taken into account when thinking about potential improvements or significant changes in teaching methods of faculty.

Empirical Study

The research presented here was conducted among students of the Faculty of Administration (FA), which is part of the University of Ljubljana, Slovenia. The FA educates students in the field of administrative science. The Faculty offers two undergraduate study programmes (1st cycle) – University Study Programme in Public Sector Governance and a Higher Education Professional Study Programme in Administration. Both programmes are provided in a combination of traditional face-to-face teaching and e-courses where LMS Moodle has been used for e-learning since 2009 (Umek et al., 2015).

The present study aims to analyse two long-running surveys (students' evaluation of e-learning aspects and their evaluation of the competencies acquired) at the FA and to find links between them. Since both surveys depend on students' opinions, we added an objective performance measure, namely students' average grade. For each individual student who participated in our survey, we collected 7 opinions on e-learning, 25 opinions on the level of competencies acquired and the average grade for all exams they had passed.

Data
Our data originate from two different questionnaires; one on competencies and the other on aspects of e-learning. The survey on competencies is based on a questionnaire initially intended for FA graduates. Part of this questionnaire comprises a list of 25 competencies students should acquire during their studies. For our survey, we used the list of competencies shown in Table 1.

The students express their opinions on the competencies they had acquired on a 6-level scale from 1 ("not acquired at all") to 6 ("fully acquired").

Table 1

List of Competencies Included in the Questionnaire (S – Specific, G –Generic)

Label		Description
C1	S	Professionalism and practical experience in the field of administration.
C2	S	Knowledge of and dealing with research methods and procedures in the field of social sciences.
C3	G	Ability to analyse, synthesize and anticipate solutions and consequences of a phenomenon.
C4	S	Ability to be critical or self-critical in social issues.
C5	G	Ability to obtain maximum results in negotiations.
C6	G	Ability to keep functioning effectively when under pressure.
C7	G	Ability to take advantage of an opportunity, being proactive.
C8	G	Ability to coordinate activities (in a team).
C9	G	Ability to efficiently use time.
C10	G	Ability to cooperate productively in a team.
C11	G	Ability to motivate people (and move toward a common goal).
C12	G	Ability to speak clearly and be easily understood.
C13	G	Ability to establish own authority.
C14	G	Skills in the use of information (from the Internet) and communications technologies.
C15	G	Capacity to generate new ideas and solutions.
C16	G	Ability to discuss values in approaches, ideas, and solutions of oneself and others.
C17	G	Ability to solve problems.
C18	G	Ability to make business decisions autonomously.
C19	G	Ability to present ideas, arguments, ideas, or reports clearly and concisely.
C20	S	Ability to write reports, records, and documents in the administration.
C21	G	Ability to communicate verbally and in writing in at least one foreign language.
C22	S	Professional knowledge of other countries in the fields of economics, society and the law.
C23	G	Knowledge of cultural differences.
C24	G	Ability to work with people from different cultural backgrounds.
C25	S	Ability to assess acts and practices in accordance with professional ethics in administration.

The second data source is a questionnaire-based survey started in 2014 at the FA (see Aristovnik et al., 2017). Once a semester we ask our students to evaluate several aspects of e-courses in which they are enrolled. In addition to

questions about a specific e-course, the questionnaire includes several general statements about e-learning. This part of the questionnaire is therefore used for our survey. The list of these selected aspects is shown in Table 2.

Table 2

Aspects About e-Learning

Label	Description
A1	Working with computers for study purposes suits me.
A2	The Moodle e-learning system is easy to use.
A3	The Moodle system is reliable and stable (it does not crash, submitted tasks are not lost).
A4	I am satisfied with the support and assistance in the event of technical problems.
A5	Working with computers for study purposes is not difficult for me.
A6	E-learning contributes to higher student academic performance.
A7	E-learning is a quality replacement for traditional learning in the classroom.

The students express their opinions on the statements in Table 2 on a seven-point Likert scale from "totally disagree" (value 1) to "totally agree" (value 7). Students can also choose N ("do not know") or even to not respond at all since survey participation is not obligatory. Missing responses and the value of N in the survey analysis are considered as missing values and are excluded from the study.

During the 2016/17 academic year, 2nd year students of the university study programme were involved in the research. Our population of interest were 84 students, 51 (61%) of them participated in the survey on competencies and 45 (54%) in the survey of aspects of e-learning; 41 (49%) participated in both surveys. Students voluntarily participated in the survey, without any coercion or undue influence. Both questionnaires (competencies and aspects of e-learning) were carried out online. In both surveys, we ask students for their student ID number to help us link the obtained results with various sources. Data from both questionnaires answered by 41 students were analysed. Additionally, we compared the students who participated in the survey to those who did not. The analysis showed no bias in gender, high school final grade and region, but the average grades from university were significantly higher for the students from our survey (mean: 8.05) compared to the students who have not participated in the survey (mean: 7.32).

Methodology and Empirical Results

We calculated 175 Spearman's correlation coefficients between 25 competencies (C1…C25) and 7 aspects (A1…A7) of e-learning (175 = 25 * 7) and 32 correlations between the average grade (AG) and all competencies and aspects of e-learning (32 = 25 + 7). Altogether, we computed 207 Spearman's correlations and corresponding p-values. Due to the large number of

hypotheses tested, we adjusted p-values using a False Discovery Rate (FDR) correction (Yoav & Hochberg, 1995). For a FDR level of 0.2, we found 27 significant correlations (14% of all pairs we analysed).

Table 3 shows 27 significant correlations (Spearman's r) between analysed competencies (C1…C25), aspects of e-learning (A1…A7) and the average grade (AG) and corresponding significances (Sig.).

Table 3

Significant Correlations (R) between Analysed Competencies (C1…C25), Aspects of e-Learning (A1…A7), and the Average Grade (AG)

Pair		r	Sig.	Pair		r	Sig.	Pair		r	Sig.
C21	AG	0.601	3.29E-05	A1	AG	0.440	0.004	C4	A1	0.396	0.010
C17	A1	0.584	6.06E-05	C16	A1	0.437	0.004	C7	A1	0.386	0.013
C14	A6	0.549	2.03E-04	C16	AG	0.435	0.004	C15	AG	0.380	0.014
C19	AG	0.541	2.59E-04	C18	A6	0.433	0.005	C5	A5	0.370	0.017
C21	A1	0.533	3.37E-04	C6	AG	0.431	0.005	C24	A1	0.365	0.019
C12	AG	0.517	0.001	C4	AG	0.422	0.006	C5	AG	0.361	0.021
C8	AG	0.479	0.002	C6	A1	0.413	0.007	C13	A6	0.359	0.021
C15	A1	0.474	0.002	C21	A2	0.412	0.007	C25	A3	-0.356	0.023
C15	A6	0.454	0.003	C25	A6	0.408	0.008	C24	A5	0.352	0.024

The strongest correlation we discovered was between the competency of "speaking, reading, and writing in a foreign language" (C21) and "average grade" (AG). The correlation coefficient of r=0.601 indicates that students who think their competencies of communicating in a foreign language are good tend to have higher average grades. The correlation is significant (p=3.3E-5).

The second pair indicated quite a strong positive correlation (r=0.584) between the competency of "solving problems" (C17) and the aspect of "suitability of working with computers in the study process" (A1). This means that students who like using computers for studying think they are good at solving problems. The correlation is significant (p=6.1E-5).

The last pair we describe in more detail is the correlation of r=0.549 between the competency "using information and communications technologies" (C14) and aspect "contribution of e-learning to academic performance" (A6). This means that students who think that e-learning contributes to their better performance (i.e., high grades, lower number of admissions to exams) have a higher ability to work with computers and use information from the Internet. The correlation is significant (p=2.0E-4).

Conclusion

The Bologna Process introduced a common European area of higher education, which called for many changes to be made at European universities. Due to the comparability of studies across Europe and the mobility of students and teachers, the focus in learning is shifting to competencies and skills based on knowledge. Knowledge alone is not enough – what is also important is which (professional) skills and competencies a student acquires and how he or she is able to use them. This, of course, has affected educational methods and student performance evaluations. There is no question that education will change in the coming years; the challenge is to ensure this change will positively affect world development. To be able to change the world for the better, e-learning needs to be effective and, to improve its performance, we need to understand the factors affecting it (Aparicio et al., 2017).

In our study, we explored the correlations between the selected aspects of e-learning in the Moodle environment and the competencies students should acquire during their study. The research was based on two different questionnaires administered to Faculty of Administration students. One of the major problem we are facing in voluntary participation in survey research is the low responsiveness of our students, which was evident also in this case. This holds especially for students with lower grades – in the future we will pay more attention to motivate them to overcome potential bias in our sample. On the collected data, the survey results showed that the competency of problem-solving is highly correlated to the adequacy of e-learning. Our findings also suggest a strong correlation between the competency of computer skills and the usefulness of e-learning. Indeed, one of the main pre-conditions for benefitting from e-learning system use is that students have higher abilities in working with computers and using information from the Internet.

Our study's main limitation is the mode of measuring the level of competencies acquired. The recent measurement is based on opinions, which can produce biased results; some students overestimate their abilities while others underestimate them. Future work will focus on more objective measurements. One possible improvement will be to analyse competencies from course syllabuses and to link the listed competencies with grades in various courses. Nevertheless, the results we obtained could serve as a guide for the faculty management when further investigating how to enhance students' competencies while employing modern solutions in the teaching process.

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Author Details
Damijana Keržič
damijana.kerzic@fu.uni-lj.si
Aleksander Aristovnik
aleksander.aristovnik@fu.uni-lj.si
Nina Tomaževič
nina.tomazevic@fu.uni-lj.si
Lan Umek
lan.umek@fu.uni-lj.si