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Demographic determinants of usefulness of e-learning tools among students of public administration

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Abstract

Purpose – In higher education, blended learning is already strongly established. The e-courses vary in their structure, assignments, prompt examinations, interaction between students and teachers, etc. Such aspects may influence the students' perception of usefulness of blended learning. The purpose of this paper is to identify the factors which influence that feeling and to look for possible differences in perception by different subgroups of students.

Design/methodology/approach – Students in the survey evaluated 13 aspects of e-courses in which they were enrolled. From enrolment documents, additional demographic data were collected (gender, high-school grade, study programme, etc.). A multiple linear regression was used with perceived usefulness as the response variable and the 12 other e-course aspects as predictors. Further, the same regression analysis was performed on different subgroups of students based on demographical data.

Findings – The empirical results showed that the general impression regarding the e-courses, their consistency with the face-to-face teaching and the teachers' responsiveness had a significant influence on the students' perception of the usefulness of e-courses. Further analysis based on demographic data revealed several subgroups of students where the perception of usefulness was influenced by different aspects. The teachers' feedback and supplementing the tutorial play an important role in higher years of study, while the general impression loses its influence.

Originality/value – The paper is the first to explore the importance of demographic determinants of perceived usefulness of e-learning tools in EAPAA (European Association of Public Administration Accreditation)-accredited undergraduate public administration programmes.

Keywords Higher education, Blended learning, Moodle LMS, Public administration education, Questionnaire analysis, Students' perceived usefulness

Paper type Research paper

Introduction

In the past two decades, the use of information and communications technology (ICT) in the education process has triggered many changes in teaching approaches and techniques. Teachers, therefore, have new possibilities to make the pedagogical process more interesting and interactive. They can offer different assignments and ways of communicating without limits (regarding the place and time of teaching and learning). In this way, they go along with the new generations of students that were "born with smartphones" and are very familiar with the latest technologies. According to Jones *et al.* (2010) and Kubiatko (2013), today's young generation has a different way of thinking and functioning to previous generations.

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E-learning involves the use of ICT to deliver teaching and learning and is becoming increasingly important in higher education (Penny, 2011). When talking about changes in higher education, the introduction of new ICT tools in the teaching and learning processes has to be successful in the eyes of all stakeholders – students, teachers and management of the higher education institution. Based on adequate measurements, statistical analyses of the consequences of implementing a learning management system (LMS) have to be performed regularly and improvements made to find out whether the results are acceptable or if any improvements are needed. When deciding on the introduction of an LMS and when measuring its effectiveness and usefulness, many factors have to be taken into account. Especially on the teachers' side, many doubts emerge when a new ICT is in question. Many aspects have to be considered, especially when deciding whether to completely replace face-to-face learning with e-learning in a selected LMS or to choose blended learning where the virtual classroom supplements lectures in traditional classrooms. The students' point of view is also important, as they are the main users of the offered teaching technique and can cooperate in implementing and improving an e-course as a very important stakeholder in the e-learning process. Therefore, both teachers and students should be regularly asked to give their opinion on the work and their feelings in the virtual classroom.

In the study, we analysed only the students' point of view on the e-courses in which they were enrolled. We examined the results received from students of the two undergraduate programmes at the Faculty of Public Administration, University of Ljubljana, where Moodle LMS is used for implementation of blended learning. The purpose of the paper is thus to present an analysis of the factors that influence the usefulness of an e-course as perceived by the students. The paper explains how the students evaluate the usefulness of e-courses at the faculty level and discusses the variances among the different subgroups of students.

The paper is structured as follows: after the introduction, a brief literature review on various aspects of blended learning and its usefulness through a presentation of previous work in the field is given. The third part includes a presentation of the empirical research. At the end, based on the examined data, interpretations, conclusions and suggestions are offered. They are accompanied by the paper's limitations and avenues for further research.

Literature review

The impact of the internet-based ICT on education at all levels has captured both teachers' and students' attention in recent years (Dečman, 2015; Elkaseh *et al.*, 2016; Pinto-Llorente *et al.*, 2016). In some countries, the use of ICT in schools at all levels of education has been strongly supported by the government through initiatives for primary schools through to higher education. They have encouraged the acquisition of laptop computers for students and teachers with favourable conditions and secured broadband connections in all public establishments (Carvalho *et al.*, 2011). Although modern technologies simplify communication and availability of information, they also offer many possibilities to mislead students from learning. Salomon and Kolikant (2016) in their recent study confirmed, what has always been intuitively known, that the time spent on non-academic usage of ICT are negatively correlated with academic achievements of the students. High-school students are aware of this fact, as the same study reported that students perceive that limiting this usage would improve their

grades. With the ever-present need to demonstrate value for money and maximise efficiency and effectiveness from training and development within an often restricted time and expenditure framework, measuring the impact of enhancing knowledge management by using technology is of constant interest and importance (Smedley, 2010).

Although many universities across the world have incorporated internet-based learning systems, the success of their implementation requires an extensive understanding of the end-user acceptance process (Al-Adwan *et al.*, 2013). Saade *et al.* (2007) point out that "in general, like any information system, user acceptance and usage are important primary measures of system success". The user perspective is therefore crucial to examine the implementation of an LMS and to evaluate its success (Hall, 2006). Žuvic-Butorac *et al.* (2001) claim that students' perception of e-learning is one of the most important steps in developing and implementing a successful e-learning environment. Hrastinski (2008) provides a review of the literature in the area of online learner participation, and claims that participation and learning are intricately interrelated and that, for learners to take full advantage, the participation experience needs to be satisfactory.

To understand the importance of the students' point of view, in our study, we focused only on them. According to Francis and Raftery (2005), we examined the usefulness of blended learning, whereas there are two other modes of e-learning engagement:

(1) baseline course administration and learner support; and

(2) a fully-fledged online course.

Blended learning is a combination of traditional face-to-face teaching and an online course. This mixes the features of virtual and real environments to provide for the holistic production of information and enhance students' learning experience (Al-Adwan *et al.*, 2013). Recent studies showed that students' perceive blended-learning as efficient in improving their grammatical competences in English as a second language (Pinto-Llorente *et al.*, 2016).When talking about blended learning, the successful implementation of e-course, in which students and teachers cooperate in both a virtual and classical classroom, depends on many factors (Alexander and Golja, 2007; Ozkan and Koseler, 2009; Penny, 2011; Sun *et al.*, 2008; Zacharis, 2015). Vonderwell and Zachariah (2005) claim that online learner participation is influenced by technology and interface characteristics, content area experience, student roles and instructional tasks and information overload. The assessment of whether the implementation of an e-course is successful or not should be given by both groups of users, teachers and students. Of course, the management of the educational institution also has to discover whether the introduction of blended learning leads to better students' results (e.g. higher grades, fewer admissions to exams), lower costs and the satisfaction of all stakeholders (Hall, 2006; Koohang and Durante, 2003; Upadhyaya and Mallik, 2013; Yukselturk and Bulut, 2007).

Several authors have studied the factors influencing the learners' successes in the online course. In the studies, they analysed data obtained from the LMS system, such us interaction between student–student or student–teacher in the e-course, the time a student spends in the e-course, when does the student first encounter the relevant material in the e-course, frequency of the student's accesses of the e-course, the time the student spends in the e-course, late submissions, etc. You (2016) claims that

self-regulated online learning is essential part of course achievement. He observed indicators obtained from LMS data (timely completion of assignments, frequently viewing course materials and reading of important course information) and the score of the midterm exam and found out that they are significant for predicting the final achievement of the course. Zacharis (2015) in his study investigated the relationship between different LMS data and student achievement in a blended learning course with the purpose being able to determine the students with risk to fail. His research has shown that a high level of student's active participation in e-course (such as reading and posting forums, chatting, etc.) is the main factor indicating successful completion of the course. The other two factors are "content creation contribution" and "students' engagement with online quizzes".

To understand the importance of the students' point of view, in our study, we focused only on them. We believe that the study presented below contributes some important findings to both theory and practice in the field of blended learning.

Research methodology

The Faculty of Public Administration is a member of the University of Ljubljana, Slovenia, offering students interdisciplinary first- and second-cycle university study programmes in public sector governance and higher educational professional study programme in public administration, which last three years, two semesters each. Both programmes include courses dealing with the main areas of public administration study – administrative, legal, economic, management and ICT courses. The Faculty of Public Administration is using the Moodle LMS platform. The open-source Moodle LMS can be found in many segments of education and higher education is no exception. Its popularity, except for the fact it is free, is mainly based on its flexibility, adaptability and the possibility of personalisation, while, on the other side, the system contains many standard features which make the learning process easy to implement. Some of the reasons why Moodle was chosen were that the system is easy to use, contains many standard features and significant elements of an effective e-learning system to support pedagogical process, and on the other side, it is flexible, adaptable and allows personalization (Liao *et al.*, 2011; Kareal and Klema, 2006). When comparing some open-source LMSs, Kareal and Klema (2006) also stressed that Moodle is the most user-friendly e-learning system among the systems under comparison. Carvalho *et al.* (2011) studied students' perceptions of Blackboard and Moodle at Portuguese universities and ascertained that all their findings "reveal a student preference towards Moodle". In their research, they also found that e-learning materials substituted the traditional courses.

The Faculty implemented blended learning with open-source Moodle LMS in the academic year 2008/2009. After three years of gradually introducing them, e-courses became mandatory for all undergraduate study courses (Umek *et al.*, 2015). Until now, quite a few changes have been made and some additions introduced in virtual classrooms. Currently, each lecture is supported by e-content, followed by a quiz to check understanding of the prepared content in the e-course. For the tutorial, two extensive assignments are prepared during the semester and the teacher gives feedback on the correctness of the solutions.

Methodology, data and descriptive statistics

In our study, we analysed how different aspects of an e-course influence students' perception of the usefulness of blended learning. Based on the empirical findings from recent literature (Liaw, 2008; Ellis *et al.*, 2009; Sun *et al.*, 2008; Upadhyaya and Mallik, 2013; Žuvic-Butorac *et al.*, 2001), we developed a questionnaire which suits to the blended learning implemented at the Faculty.

We limited our survey to courses that were obligatory for undergraduate students. Blended learning is mandatory for these courses. The questionnaire consisted of 13 statements (Table I) describing the e-course. We determined 12 aspects (Q1-Q12), which we assumed influence students' perceptions of the usefulness of the e-course. So, the students estimated their satisfaction with the organization of the e-course (goals, materials and assignments), the teachers' activities (assessments, responses), their preferences concerning e-learning in virtual classroom and face-to-face in the classroom, the general impression of the e-course and the degree of consistency with the lessons and tutorials in the classroom.

Undergraduate students were invited to participate voluntarily in the survey. The students expressed their opinions regarding the statements in Table I on a seven-point Likert scale from "totally disagree" (value 1) to "totally agree" (value 7) for each e-course they were enrolled in the spring semester in the academic year 2014/2015; with an additional possibility "I do not want to answer/no experience". As the primary focus of our study was to analyse factors which influence students' perceived usefulness, statement Q13 was chosen as the dependent variable.

Abbreviation	Statement about e-course
Q1	The virtual classroom of the course is organised transparently
Q2	The goals (workload demands, grading) of this e-course were clearly stated at the start of the semester
Q3	This e-course offers a variety of ways to assess my learning (quizzes, written work, forums, files, . . .)
Q4	I receive the teacher's comment/feedback on an assignment in less than 7 days
Q5	I prefer fewer lectures in the traditional way (face-to-face) and more learning material processed in the e-course
Q6	More tutorials in the course could be carried out in the e-course instead of in the classroom
Q7	My general impression of the e-course is good
Q8	The study material and tasks of the e-course are presented in a clear and understandable way
Q9	Finding certain activities in the e-course is simple
Q10	The prepared learning material and tasks are consistent with the lectures in the classroom and supplement them
Q11	The prepared material and assignments supplement the tutorial in the classroom
Q12	The teacher gives me feedback/a response on my submissions (assignment, forum posts)
Q13	Learning materials and activities in the e-course helped me to effectively study this subject matter

Source: Survey (2015)

Table I.
Statements from the survey

We limited our survey only to the courses that are obligatory and where blended learning is mandatory. Depending on schedule in the observing semester, each student evaluated three to five different e-courses. The questionnaire was completed by 315 students, and we collected 1,456 e-course evaluations (records). Due to missing values, we removed some records from our initial data set. The final sample for analysis is contained in 1,083 records, each representing a student evaluating one e-course. Our goal was to relate the students' perceived usefulness of blended learning (statement Q13) with the other variables from Table I. For this purpose, we built a multiple linear regression model with variable Q13 as the response variable and the others (Q1-Q12) as predictors.

To summarise the results of our survey, we computed basic statistics of all variables included in the analysis. In Table II, we report their mean, standard deviation, skewness and kurtosis. The independent variables are sorted descending based on their means. The bottom row contains the descriptive statistics of the dependent variable Q13. The majority of means (9 out of 12 independent variables) is grouped in a small range from 5.59 to 5.88. Our students expressed the highest level of agreement with the statements about the teachers' feedback on submissions (Q12), a variety of activities in e-course (Q3) and clear goals of the e-course at the beginning of the semester (Q2). The results indicate that our students are very satisfied with the majority of the aspects of e-courses.

Three statements were on average evaluated with score less than 5. These statements include simplicity of finding relevant activities (Q9) and the preferences to face-to-face learning (tutorial Q6 and lectures Q5).

Table II shows that the majority of the variables we analysed is negatively skewed. The left tails of the distributions are longer; the majority of the answers express a high level of agreement with the statements.

In our analysis, the variable Q13 plays the most important role. Our main goal is to predict its values based on the values of other independent variables. Its descriptive statics is similar to majority of the predictor variables: it has a very high mean value (5.46 on seven-point scale) and negative skewness. To get more insight to its distribution, we presented the relative frequencies with a bar chart (Figure 1). Figure 1 indicated that the majority of the participants in our survey think that the e-courses are

Table II.
Descriptive statistics of the variables from the survey

Variable	Mean	SD	Skewness	Kurtosis
Q12	5.88	1.39	−1.43	1.76
Q3	5.84	1.32	−1.20	1.16
Q2	5.83	1.37	−1.22	1.08
Q8	5.75	1.33	−1.06	0.76
Q1	5.74	1.37	−1.08	0.70
Q10	5.72	1.30	−1.04	0.83
Q7	5.70	1.34	−1.08	0.93
Q11	5.69	1.32	−1.06	0.95
Q4	5.59	1.56	−1.14	0.70
Q9	4.42	1.93	−0.15	−1.15
Q6	3.80	2.09	0.06	−1.27
Q5	3.79	2.09	0.09	−1.25
Q13	5.46	1.53	−0.97	0.38

useful (Answers 6 and 7 – totally agree represent more than a half of our sample). Contrary, the values 1 (totally disagree about the usefulness) and 2 occur in less than 5 per cent of the answers.

Recent study (Umek *et al.*, 2015) has already shown the heterogeneity among the students at the Faculty of Public Administration based on demographic factors. For further analysis, we added six demographic variables concerning the student into each obtained record, namely:

(1) gender (male, female);

(2) high school final grade (from 2 – sufficient to 5 – excellent);

(3) year of study (first, second, third);

(4) study programme (university, professional);

(5) region (students from the Ljubljana region where the faculty is located, and all other regions of Slovenia from where students come); and

(6) occupation with other regular weekly activities besides study (hours per week for e.g. student work, sports training etc.).

Five of them we obtained from the students' information database maintained by the Faculty, the values for the last one were obtained from a question in the survey asking the students whether they are occupied with any other activities besides their study. The final sample for the research analysis is presented in Table III with sizes of subgroups based on demographic factors.

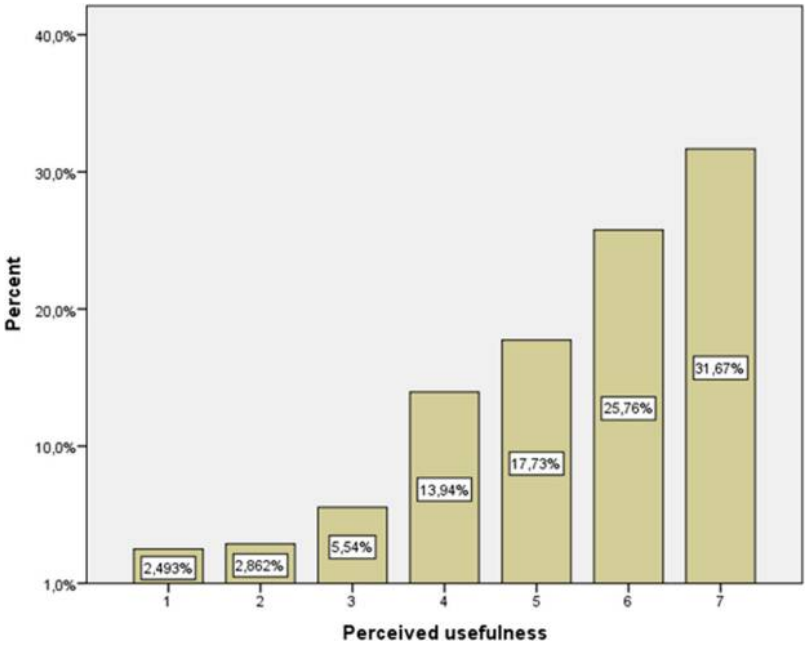

Figure 1.
The frequency distribution of the dependent variable Q13 (perceived usefulness)

Subgroup	*n*
Whole sample	1,083
Gender	
Male	284
Female	799
High school final grade	
Sufficient (2)	442
Good (3)	318
Very good (4)	205
Excellent (5)	113
Year of study	
First	698
Second	161
Third	224
Programme	
University	436
Professional	647
Region	
Outside Ljubljana	473
Ljubljana	610
Occupation with other regular weekly activities besides study	
No activities	71
Less than 2 h per week	92
Between 2 and 6 h per week	241
Up to 2 h per day	190
Between 2 and 6 h per day	200
More than 6 h per day	289

Table III.
Final sample

Regression analysis on the whole sample could, therefore, hide interesting patterns in our data set. For this reason, we repeated the analysis on different subgroups of students based on their demographic characteristics.

Empirical results and discussions

In the empirical results part, which follows, we report the coefficients, unstandardised and standardised, and the corresponding p-values. We highlight and discuss variables showing a significant impact on the mean perceived usefulness of blended learning.

In the analysis of the results, a multiple linear regression model was built with predictors' variables Q1-Q12 and Q13 as the response variable. As the primary focus of our research was to analyse factors that influence students' perceived usefulness with the e-course, the last statement Q13 was chosen as the dependent variable. The multiple linear regression showed that variables Q1-Q12 have a significant impact on students' mean perceived usefulness ($F_{12,1070} = 106.065$, $p < 0.001$), choosing for the level of significance $\alpha = 0.05$. The model explained 54.3 percent of the variance in students' perceived usefulness, while the standard error of the estimate was 1.039. Table IV shows

coefficients (unstandardised and standardised), *t*-statistics and the corresponding *p*-values for all predictor variables Q1-Q12. Predictors with a significant impact on the mean value of Q13 (usefulness) are shown in bold.

The strongest impact on perceived usefulness was found for variable Q7 (good general impression of the e-course) which has the largest standardised regression coefficient of 0.222. This means that an increase in the general impression of an e-course by 1 standard deviation on average increases the perceived usefulness by 0.222 of a standard deviation.

The other predictors with a very similar (yet somewhat weaker) impact on response Q13 are Q10 and Q11 (e-course supplements face-to-face learning well), Q7 (general impression of the e-course), Q5 (preference for e-learning over face-to-face learning), Q12 (teacher's response), Q8 (understandability of the study material) and Q4 (teacher's prompt feedback). The impact of all mentioned predictors (with the exception of Q4) is positive, i.e. an increase in them on average increases students' perceived usefulness.

On the other hand, the impacts of the other predictors are not significant. These predictors are Q1 (transparent structures of the e-course), Q2 (workload demands clear in advance), Q3 (a variety of activities), Q6 (e-courses instead of a face-to-face tutorial) and Q9 (simplicity of finding relevant activities).

According to the students' answers in the survey, the empirical study of the whole sample showed that a good general impression of the e-course and supplementing traditional face-to-face learning with e-learning increase students' perceived usefulness of e-course. It means that an e-course which offers additional topics to face-to-face learning and makes a good general impression on the students is more likely to be perceived as useful by students.

As already mentioned, our previous study (Umek *et al.*, 2015) revealed that the student population at the Faculty of Public Administration is very heterogeneous. We showed that the introduction of the Moodle LMS in recent years has had different impacts on various subgroups of students based on demographic factors. Therefore, we expected that the perceived usefulness of blended learning could also be influenced by

Variable	Unstandardized coefficients β	Unstandardized coefficients Standard error	Standardized coefficient β	t	Significance
Intercept	−0.541	0.185		−20.922	0.004
Q1	−0.002	0.043	−0.002	−0.047	0.963
Q2	−0.024	0.039	−0.021	−0.605	0.545
Q3	0.037	0.035	0.032	10.062	0.288
Q4	−0.093	0.026	−0.095	−30.554	*0.000*
Q5	0.123	0.024	0.168	50.096	*0.000*
Q6	−0.015	0.024	−0.021	−0.623	0.534
Q7	0.252	0.042	0.222	60.033	*0.000*
Q8	0.151	0.040	0.131	30.814	*0.000*
Q9	0.010	0.018	0.012	0.548	0.584
Q10	0.252	0.042	0.215	60.018	*0.000*
Q11	0.210	0.041	0.181	50.155	*0.000*
Q12	0.180	0.030	0.164	60.035	*0.000*

Note: In order to assure transparency, factors are written in italics and their values in regular font

Table IV. Parameters of the linear regression model with the perceived usefulness of blended learning as the response variable

different factors among various subgroups of students. We applied the same linear regression model (response variable Q13, predictors Q1-Q12) to 15 subgroups of students based on their demographic characteristics. These subgroups were established based on their gender, high-school final grade, year of study, study programme, region and their occupation with other regular activities besides study per week. Our preliminary study suggested analysing just two "regions" (students from the Ljubljana region where the faculty is located, and all other regions). Due to transparency, we reported just two subgroups of students based on their other activities (no other activities, more than 6 h of extracurricular activities per day).

Table IV shows the results of the linear regression on the 15 analysed subgroups, where each row presents the results for a particular subgroup. For convenience, in the subgroup analysis, we report just the predictor variables with a significant impact and do not report the p-values. Due to the high number of tested hypotheses, we used a Bonferroni correction to control the family-wise error rate. We report their coefficients of determination (R^2) and indicate predictors Q1-Q12 with a significant impact on the mean of Q13, indicating factors with a significant impact on the mean perceived usefulness. Instead of reporting the p-values, we divided the impacts into four categories, from non-significant with an empty cell to highly significant with ***. Table IV shows how the analysed subgroups differ, i.e. which factors are important for usefulness in which subgroup.

Table V shows that the interpretation of the results is the same for the whole sample and for female students. The predictors with a significant impact on perceived usefulness are the same. On the contrary, only two aspects are important for the male university students:

(1) the general impression of the e-course (Q7); and

(2) the teacher's responsiveness (Q12).

The analysis showed differences among students based on their high-school grades; students with the best high-school grades find the usefulness of blended learning in supplementing the tutorials. In contrast, students with lower high-school grades see the usefulness in the replacement of face-to-face learning.

The factors influencing perceived usefulness also change when comparing the year of study. In higher years of study, the teacher's feedback and supplementing the tutorials have an influence on perceived usefulness. On the other side, the general impression of the e-course does not play a significant role any more. Table V also shows that in the first year of study, many aspects are significant, whereas later, only a few of them remain important.

Table V shows differences between the two study programmes, the amount of other activities outside of study and the region of Slovenia where students come from. Students who live away from the university campus (region: outside Ljubljana) find the usefulness of blended learning in supplementing traditional learning, both tutorials and lectures. For this subgroup, only two aspects have a significant impact.

Although our sample is very mixed, some characteristics of all analysed subgroups are the same. We found no significant impact on perceived usefulness for predictors Q1 (transparent structures of the e-course), Q2 (workload demands clear in advance), Q3 (a variety of activities) and Q9 (simplicity of finding relevant activities).

Subgroup	R^2	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
Whole sample	0.543				*	***		***	*		***	***	***
Gender													
Male	0.514							*					*
Female	0.560				*	**		**	*		***	**	***
High school final grade													
Sufficient	0.530				*	***		*	*		*		**
Good	0.568										***		*
Very good	0.570												
Excellent	0.724							*				***	
Year of study													
First	0.527					*		***	*		*	***	**
Second	0.556							*					
Third	0.598										**		***
Programme													
University	0.564				*			*			*		***
Professional	0.549					**		***	*		***	**	
Region													
Outside Ljubljana	0.600										**	*	
Ljubljana	0.525					**		***	*		**	**	***
Other activities													
No activities	0.522					**	**						
More than 6 h per day	0.601					*		**					*

Notes: Legend: empty cell Bonferroni adjusted $\alpha > 0.05$; *$0.01 < \alpha <= 0.05$; **$0.001 < \alpha <= 0.01$; *** $\alpha <= 0.001$

Table V. Linear models on different subgroups of students

To clarify our study, we presented the results from Table V in the form of a network (Figure 2). The network consists of two sets of nodes which represent the analysed subgroups (black dots) and statements from the questionnaire (independent variables, grey dots). Two nodes are connected if a variable has a significant impact on perceived usefulness of the analysed subgroup. Note that some of the analysed subgroups and statements are not shown in the network, as they do not reflect any significant findings. Network was plotted using the Pajek software (Batagelj and Mrvar, 2016) with a Fruchterman–Reingold (Fructerman and Reingold, 1991) drawing algorithm. A subgroup (black dot) and a variable (grey dot) are connected if we found a significant impact of the variable on the perceived usefulness of blended learning in a subgroup of students.

We can clearly see in the network in Figure 2 which vertices have many connections. If a grey node is connected to several subgroups, it means that the variable has a significant influence on perceived usefulness for different subgroups of students. We can deduce such statements from Figure 2: general impression, teacher's feedback, clarity of study materials, etc. On the contrary, the nodes with fewer connections are specific to fewer subgroups. Some statements from the questionnaire are missing, which

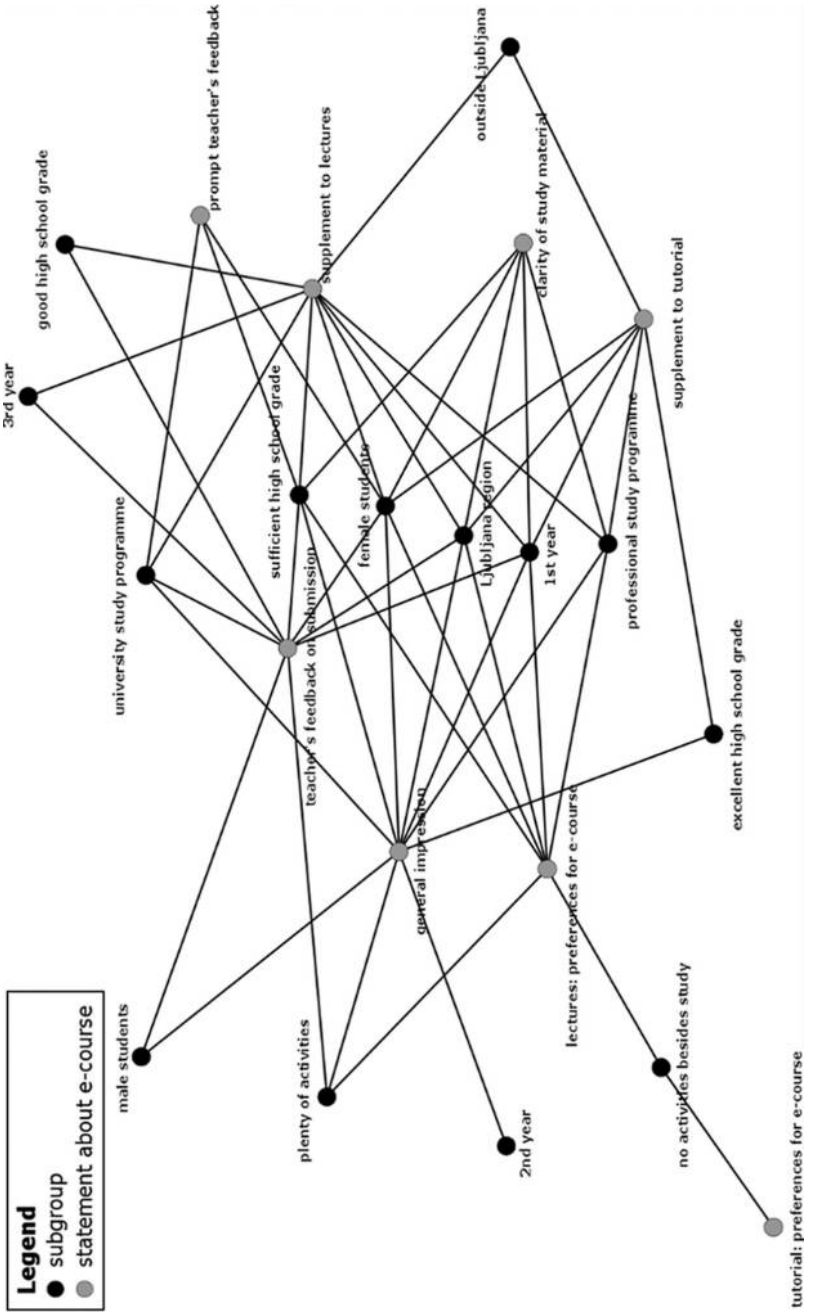

Figure 2.
Network of variables and subgroups

means we did not find any subgroup where they play an important role regarding perceived usefulness.

Similar conclusions can be drawn for the black dots. If a subgroup is connected with several variables, it means there are several factors which influence the students' perceived usefulness. Examples of such subgroups are female students, students from the Ljubljana region, students with a sufficient high-school grade, etc. In contrast, for students in the second year of study, just the general impression plays a significant role. There are some other subgroups with only two influencing factors, such as male students, students with excellent high-school grades, etc. Because various subgroups are connected to different variables, Figure 2 clearly shows the heterogeneity of the population we analysed.

Conclusion

The main goal of the paper was to present an analysis of the factors that influence the usefulness of an e-course as perceived by students. We examined the results received from students of two undergraduate programmes at the Faculty of Public Administration, University of Ljubljana, where Moodle LMS is used for e-learning. In this respect, the paper's key contribution is explaining how the students evaluate the usefulness of e-courses at the faculty level and the discussion of the variances among the different subgroups of students.

The descriptive statistics showed very high mean values and negative skewness of the majority of aspects we analysed. The perceived usefulness as the dependent variable had same properties: mean value of 5.46 on a seven-point scale with more than 50 percent of answers grouped on values 6 and 7. That means that our students find e-courses useful and express general positive attitudes to e-courses.

To confirm theoretical expectations, we empirically analysed the influence of 12 aspects of an e-course. Four of them (structures of e-course, workload demands being clear in advance, a variety of activities and simplicity of finding relevant activities) had no significant impact on perceived usefulness – on either the whole sample or on each subgroup analysed. Our empirical results also showed that the general impression regarding the e-course, their consistency with face-to-face learning and the responsiveness of teachers had a significant positive influence on the students' perceived usefulness. More detailed analysis revealed interesting subgroups of students where the relationship between perceived usefulness and the other analysed aspects differs. We discovered that the general impression plays an important role in determining a higher level of perceived usefulness in the majority of subgroups we examined. For male students, besides the teacher's responsiveness, the general impression was the only significant aspect in relation to perceived usefulness. However, we discovered that the general impression loses its impact in higher years of study when the other aspects become important (teacher's feedback, supplement to face-to-face learning).

Interestingly, the factor "transparent organization of the virtual course" was non-significant in all subgroups we analysed. On the contrary, the intuitively similar "general impression" factor played an important role in almost all subgroups. The results therefore reflect the fact that "transparent organization" and "general impression" measure two different aspects – the e-classroom can be transparent, but its general impression may still be poor. Such courses probably only provide basic

information in basic colours and fonts without any additional pictures, links to multimedia sources, etc. In contrast, some students may prefer a less organized structure with lots of colours in the title, funny pictures, etc. Accordingly, these findings may provide useful guidelines for the structure and design development of e-courses in the future e-learning system at the Faculty of Public Administration.

However, as we focussed on the perceived usefulness of blended learning from the students' perspective, our study obviously neglects the teachers' perspective. To overcome this limitation, we plan to develop a new survey. We will ask teachers about their views on blended learning (amount of work needed for an e-course, communication with students, preferences (e-courses vs face-to-face courses) etc.). In the next step, we will aggregate the current results to the level of an e-course and link them with the results emerging form the new questionnaire. Moreover, our recent study showed a significant increase in students' performance in the period after the Moodle LMS was introduced. Therefore, in our future research, we plan to use data on students' performance and link the results with our current study. This extended study would indicate which aspects of e-courses are linked to better student performances.

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