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The Quality Indicators of E-learning: Business vs. Education

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Abstract

Nowadays, the technological revolution brings significant changes in all spheres of society, including learning in both the business and education environments. Consequently, the quality and usefulness of e-learning systems are gaining importance in the contemporary competitive market. In order to enhance users' satisfaction, organizations have to put more effort into identifying and understanding significant influential factors. This study strives to establish quality indicators as factors that affect e-learning user satisfaction by comparing business and education contexts. The results gathered through 1350 valid questionnaires are evaluated using Structural Equation Modeling (SEM). The conceptual model is developed and consists of six quality indicators: Individual Impact, Cooperation Quality, Information Quality, System Quality, Usefulness, and Satisfaction. By considering relationships between Information Quality and System Quality according to the Usefulness of e-learning, findings indicate important differences between education and business users' perceptions. This research contributes to the dual observation of the expectations and attitudes of the observed groups of respondents.

Keywords*: business; education; e-learning; indicators; quality; satisfaction.*

Introduction

Nowadays, the internet affects the civilization where "everything and everyone is getting online," enabling companies to "track their performances and online behaviour, and customize communications, products and services" (Navimipoura & Soltanib, 2016, p. 1052). In the last few years, the enlarged utilization of the internet and information technologies has increased so significantly that it has brought about a technological revolution. This revolution has influenced a large number of industries, including the

education system. There are several ways to use internet technologies in education. For example, Dominici and Palumbo (2013) indicate e-learning is not equal to ubiquitous learning (u-learning) and distance learning. Distance learning is a form of education where learners may not always physically attend classes (Kaplan & Haenlein, 2016). It is "one element of e-learning" and "is not the main differentiator", while u-learning refers to the opportunity to learn anywhere (Dominici & Palumbo, 2013, p. 88). In this study, e-learning is defined as instruction delivered via a digital device intended to promote and advance the quality of learning (Mayer, 2017) „by providing access to resources and services" and "enabling remote exchange and collaboration" (Navimipour & Zareie, 2015, p. 475). It represents a valid solution for avoiding problems related to physical mobility by allowing students/customers to follow individual online courses within their homes.

To the authors' knowledge, a minor number of papers have dealt with the perception of e-learning in business surroundings (Demirkan, Goul & Gros, 2010; Koohang & Harman, 2007; Poór, Sasvári, Szalay, Pető, Gyurián, Suhajda & Zsigri, 2020; Sambhanthan & Potdar, 2017), especially in comparison with its application for educational purposes. Calvo and Villarreal (2018) state that e-learning solutions in companies, particularly educational institutions, are widely accepted on the market. Although these topics are mostly related to student and staff satisfaction and the usefulness of e-learning in education (Alsabawy, Cater-Steel & Soar, 2016; Al-Samarraie, Teng, Alzahrani & Alalwan, 2018; Cheok & Wong, 2015; Hammouri & Abu-Shanab, 2018), some studies point out business aspects of e-learning (Demirkan, Goul & Gros, 2010; Koohang & Harman, 2007). Some of them are system cost-effectiveness, sustainability, and marketability. Sambhanthan and Potdar (2017) emphasize the enterprise perspective of e-learning in business by indicating managerial, economic, and service-oriented aspects.

Information on customer satisfaction is of great importance for customer service-oriented organizations (Andrea, Gremyr & Halldórsson, 2020) since the benefits of e-learning are based on user satisfaction and the factors that affect it. In the e-learning context, user satisfaction and its relationships with other variables have commonly been studied (Hong, Tai, Hwang, Kuo & Chen, 2017; Pham, Limbu, Bui, Nguyen & Pham, 2019; Shahzad, Hassan, Aremu, Hussain & Lodhi, 2020). Satisfaction is related to how the users feel the e-learning system meets their needs or expectations (Harrati, Bouchrika, Tari & Ladjailia, 2016), and "it is a measure of the successful interaction between an information system and its users" (Kurt, 2019, p. 1176). The positive impact between service quality and customer satisfaction has been confirmed through some studies (Budianto, 2019), where service quality is seen as an antecedent of user satisfaction (Ekinci, 2003) and vice versa (Cronin & Taylor, 1992). Taking the foregoing into account, the paper aims to determine the quality indicators significant for e-learning user satisfaction by comparing different purposes of use—business vs. education.

The next chapter is dedicated to relevant user satisfaction literature in e-learning surroundings, as well as factors that directly or indirectly influence this output variable.

Accordingly, the proposed hypotheses have been developed. The third and fourth sections present the statistical methodology, results and discussion, and concluding remarks follow.

Theoretical framework

In a business environment, the e-learning system is an important management tool for human resources to improve the efficiency of the processes of corporate knowledge and employee development (Emilova, 2016). The main intention of education is to help businesses and set learners into the industry (Traxler, 2018). Recently, Poór et al. (2020) investigated the use of e-learning and its practical implications in organizations. They generally concluded that a vast number of companies and institutions did not accept e-learning because of a lack of motivation and because they did not see benefits. Besides, the same authors find that e-learning is used for training mainly for white collars and, to a lesser extent, for blue collars, highlighting that its application is highest in public organizations. Finally, Poór et al. (2020, p. 10) find that there is "no significant correlation between educational institutions and e-learning use". On the other side, Lalic et al. (2017) quote different benefits of e-learning in manufacturing, such as independently reading material by employees posted on the computer, self-testing of acquired knowledge, interaction with other participants, control over learning, and reduced costs of training.

In the e-learning literature, the quality term is commonly used because it is one of the key challenges for theoretical and practical use to make e-learning as important as traditional learning (Ehlers, 2004). Quality, as a crucial determinant of competitiveness, could be defined and measured in accordance with the demands of markets through a customer's perception of the expected and perceived performance of services or products (Danish et al., 2018). Several studies have proven the existence of positive correlations between service quality and customer satisfaction (Budianto, 2019). Further, user satisfaction acts as the key predictor of their loyalty (Cheng et al., 2011) and trust (Dabholkar & Sheng, 2012) as the confidence that they have towards service providers (Boshoff & duPlessis, 2009). As well, it could be said that user satisfaction positively affects their future intent to order a product or service (Huddleston, Whipple, Mattick & Lee, 2009). Customer satisfaction is also seen as an influential factor in an organization's financial performance and expenditures associated with persuading customers and providing convenience to them (Lim, Tuli & Grewal, 2020). Cheng et al. (2011) further argue that customer satisfaction is important as a measure of their behaviour and a crucial indicator of business efficiency (Sandada, 2013). That is why information on customer satisfaction is of great relevance for customer-service-oriented organizations, where customer perception of quality is highly associated with the in-use phase of products and services (Andrea, Gremyr & Halldórsson, 2020), regarding their efficiency and efficacy. Consequently, the key to organizational success is its ability to continuously listen to its surroundings (Lam, Sleep, Hennig-Thurau, Sridhar & Saboo, 2017), that is, its customers (Storey & Larbig, 2018).

Nowadays, the increasing use of digital technologies has changed the way business is done, including the area of education (Dominici & Palumbo, 2013). The same authors pointed out that, besides e-learning for students, corporate training is another pertinent target for e-learning providers. In both cases, in the last decade, the development of high-quality e-learning systems became crucial to meeting customers' requirements because the real aim of every business is to satisfy the needs that drive customer satisfaction (Dominici & Palumbo, 2013). Therefore, customer satisfaction is found to be an important driver of competitiveness in e-commerce as well (Gerasimenko & Razumova, 2020; Navimipoura & Soltanib, 2016). There is a significant relationship between e-service quality and customer satisfaction, as well as customer satisfaction and purchase intention (Dhingra, Gupta & Bhatt, 2020). With the collected and analyzed information from customers, companies can make better decisions (Mahdavi, Movahednejad & Adbesh, 2011). However, customer satisfaction must not only be seen as a differentiator from competitors but also needs to be considered as a business philosophy that tends to manage their expectations and be able, as well as responsible, to satisfy their needs (Dominici & Palumbo, 2013). The same authors proved the practical implications for educational institutions and other companies that use e-learning systems based on a customer-oriented approach. Besides educational institutions, Ho and Dzeng (2010) stated that to reduce the costs of educational training, enterprises have also started to frequently initiate online education training via the internet.

Individual impact

A vast number of previous studies have paid significant consideration to individual impact and its relationship with the information system (Chuang, Tsai, Chang & Perng, 2012; Saeed, Abdinnour, Lengnick-Hall & Lengnick-Hall, 2010; Wu & Wang, 2006). Some of these relationships were positive (Burton-Jones & Straub, 2006), while others were negative (Yoon & Guimaraes, 1995). In both cases, such results indicate there is a need for research on the individual impact on system usage (Jeyaraj, 2019), as well as its elements, cooperation, information, and quality. Individual impact relates to the advantages that are achieved by somebody as a consequence of utilizing the system (DeLone & McLean, 1992; Jeyaraj, 2019). The individual impact was used to present different features such as system performance or system quality (Schmitz et al., 2016), cooperation (Polancic, Hericko & Rozman, 2010), and information system satisfaction (Guimaraes & Igbaria, 1997; Sun, Fang & Hsieh, 2014). Therefore, the following hypotheses are set:

Hypothesis 1a. Individual Impact positively influences Cooperation Quality among respondents who use e-learning in business.

Hypothesis 1b. Individual Impact positively influences Cooperation Quality among respondents who use e-learning in education.

Hypothesis 2a. Individual Impact positively influences Information Quality among respondents who use e-learning in business.

Hypothesis 2b. Individual Impact positively influences Information Quality among respondents who use e-learning in education.

Hypothesis 3a. Individual Impact positively influences System Quality among respondents who use e-learning in business.

Hypothesis 3b. Individual Impact positively influences System Quality among respondents who use e-learning in education.

Cooperation quality

E-learning enables easy communication among participants, which is an important element of cooperation quality. Communication quality is interpreted as "a user's opinion of the degree to which a supplier holds its customary clients informed through communication means" (Odekerken-Schroder, De Wulf & Schumacher, 2003). Many determinants address cooperation quality, such as service quality and relationship quality (Wu, Huang, Tsai & Chen, 2013). Additionally, Urbach et al. (2010) highlight usefulness and user satisfaction as significant determinants of cooperation quality, while Cidral et al. (2018) observe the relationship between collaboration quality and usefulness determinants. Hence, the following two hypotheses are suggested:

Hypothesis 4a. Cooperation Quality positively influences Usefulness among respondents who use e-learning in business.

Hypothesis 4b. Cooperation Quality positively influences Usefulness among respondents who use e-learning in education.

Information quality

In today's e-environment, information is being added to the web at an amazing rate, and the quality of this information varies significantly (Pow & Li, 2015). Zwain (2019) proved that information quality is one of the predictors of users' acceptance of internet technologies in learning. In line with this, the quality of information might be taken into account for the successful use of web-based learning resources (Mohammadi & Abrizah, 2015). The same authors examined dimensions of information quality and concluded that the majority of them are associated with content quality, such as verifiability, accuracy, informativeness, reusability, completeness, timeliness, and objectivity. Alkhattabi et al. (2011) considered quality dimensions grouped into three quality factors: intrinsic, contextual representation, and accessibility. Considering the effect of information quality on user satisfaction (Demissie & Rorissa, 2019; Kurt, 2019), it could be concluded that user perceptions of internet information quality influence their use of such information in the learning process (Pow & Li, 2015). Therefore, the following hypotheses are developed:

Hypothesis 5a. Information Quality positively influences Usefulness among respondents who use e-learning in business.

Hypothesis 5b. Information Quality positively influences Usefulness among respondents who use e-learning in education.

System Quality

In the paper of Chopra et al. (2019), it can be seen that variables used for system quality vary. In this study, system quality is primarily focused on technical aspects such as ease of use, availability (Al-Fraihat, Joy, Masadeh & Sinclair, 2019; Elkaseh, Wong & Fung, 2016; Liaw, 2008; Mohammadi, 2015), and a well-organized e-learning system (Ozkan & Koseler, 2009).

An adequate system quality enables learners "to access the courses or learning material without difficulty" (Chopra, Madan, Jaisingh & Bhaskar, 2019, p. 3). System quality is often perceived as the determinant of perceived usefulness (Alsabawy, Cater-Steel & Soar, 2016; Liaw & Huang, 2013) and is assumed to affect user satisfaction (Demissie & Rorissa, 2019; Kurt, 2019). Besides, the survey conducted in a business context also shows that, among others, system quality positively affects the perceived usefulness of e-learning (Rui-Hsin & Lin, 2018). On the flip side, "system quality did not expose any significant effect on perceived usefulness" by respondents who use e-learning in education (Salloum, AlHamad, Al-Emran, Monem & Shaalan, 2019). Hence, the current study hypothesizes that:

Hypothesis 6a. System Quality positively influences Usefulness among respondents who use e-learning in business.

Hypothesis 6b. System Quality positively influences Usefulness among respondents who use e-learning in education.

Usefulness of e-learning

Usefulness is characterized as a manner of view that develops in a long-term perception of service experience and is best evaluated by performance-based measures (Cronin & Taylor, 1992). In the context of e-learning, usefulness is defined as the level to which users believe that using a particular system would enhance their job or study performance (Davis, 1989). According to ISO 9241, usefulness is defined as "the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use" (Jović, Stankovic & Neskovic, 2017). When users observe e-learning as useful for acquiring skills and knowledge, they are keener on using this system (Cheok & Wong, 2015). Perceived usefulness is assumed to positively affect user satisfaction (Aparicio, Bacao & Oliveira, 2017; Lee, 2010; Mtebe & Raphael, 2018; Sun, Tsai, Finger, Chen & Yeh, 2008), thus enhancing the effectiveness of e-learning (Alsabawy, Cater-Steel & Soar, 2016) and learners' self-regulation (Liaw & Huang, 2013). On the other hand, Liaw & Huang (2013, p. 21) find that "perceived satisfaction is positively related to perceived usefulness". When it comes to e-learning services, it is shown that information quality, system quality, and usefulness are some of the key factors that influence users' satisfaction as well (Al-Samarraie, Teng, Alzahrani & Alalwan, 2018; Hammouri & Abu-Shanab, 2018). Hence, the hypotheses are put forward as follows:

Hypothesis 7a. Usefulness positively influences User Satisfaction among respondents who use e-learning in business.

Hypothesis 7b. Usefulness positively influences User Satisfaction among respondents who use e-learning in education.

In this study, factors that influence user satisfaction with e-learning in both educational and business contexts are assumed. According to the developed hypotheses, the research model is depicted in Figure 1, where user satisfaction as a dependent variable is proposed with one independent and four dependent predictors.

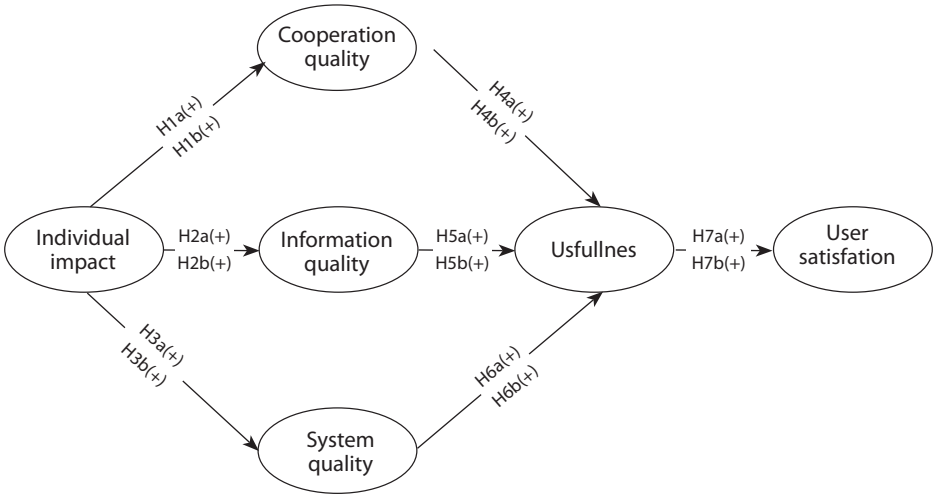

Figure 1. Research model

Methodology

To examine various factors that affect user satisfaction when utilizing different tools for e-learning, the survey was conducted in Serbia in the second half of 2019. The research included mostly young users since they were more innovative, familiar with technology, and open to new ideas than the elders (Quoquab, Yasin & Banu, 2013). The first group of users consisted of those who used e-learning for business purposes, and the second group of respondents used e-learning for education. In order to minimize bias and obtain respondents, the questionnaire used was anonymous. In this research, 1350 valid and complete responses were involved. For rating users' answers, a five-point Likert scale was employed, where 1 represents completely disagreeing and 5 represents completely agreeing. The authors used the initial questionnaire based on previous studies (Cidral, Oliveira, Di Felicea & Aparicio, 2018; Urbach, Smolnik & Riempp, 2010). The questionnaire consisted of two groups of questions. The first part consisted of questions related to the demographic characteristics of the respondents. The second part of the survey (26 questions) referred to the examination of key

factors influencing e-learning and included the following quality indicators: Individual Impact of e-learning (II), Collaboration Quality of e-learning (CQ), Information Quality of e-learning (QI), System Quality (SQ), Usefulness of e-learning (U), and User Satisfaction (S). To test a hypothesis in the proposed model of user satisfaction with e-learning, the Statistical Package for Social Sciences (SPSS) and AMOS v.20.0 were used for data analysis.

Demographic characteristics of the sample

The sociodemographic characteristics of the participants are summarised in Table 1. In the sample, there were 73.3% of female participants and 26.7% of male respondents ranging between 17 and 30 years old (99.3%). 89.3% of respondents declared that they use e-learning in everyday life. In regards to the purpose of using e-learning, 34.7% of respondents use e-learning tools for business, and 65.3% of respondents use them for educational purposes.

Table 1
Characteristics of participants' demographic profiles

Characteristics		N	Percentage
Gender	Male	360	26.7
	Female	990	73.3
Age	17-30	1341	99.3
	31-40	9	0.7
	41-50	0	0
	51 and above	0	0
Education	High school	819	60.6
	College	18	1.3
	BSc (University)	504	37.3
	PhD	9	0.7
Computer skills	Little	45	3.3
	Good	792	58.7
	Very good	513	38.0
Did you use e-learning?	Yes	1206	89.3
	No	144	10.7
The purpose of using e-learning?	Business	468	34.7
	Education	882	65.3

Structural Equation Modeling (SEM) is a technique that is used to analyze structural relationships (Nicolas, Kim & Chi, 2020; Soh, Razak, Cheng & Lau, 2020; Weston, 2006). In recent years, the SEM method has become increasingly popular in research dealing with e-learning (Al-Fraihat, Joy, Masadeh & Sinclair, 2020; Amasha & AbdElrazek, 2016; Aparicio, Bacao & Oliveira, 2017; Cidral, Oliveira, Di Felicea & Aparicio, 2018). Hence, SEM was used in this research to test the proposed model. This technique presents a combination of multiple regression analysis and factor analysis, and it is

used to analyze the structural relationship between latent constructs and measured variables (Byrne, 2016; Chin & Newsted, 1999). The SEM consists of two submodels: the measurement model for testing reliability and validity, and the structural model for testing hypotheses that are represented in the next steps.

Assessment of the measurement model

The measurement model was evaluated using different measures. First, internal consistency reliability based on Cronbach's alpha (α) and Composite Reliability (CR) values were employed. The indicators should be ≥0.70 (Hair, Black, Babin & Anderson, 2010; Urbach & Ahlemann, 2010). The obtained values of α range from 0.975 to 0.988 for the business model and from 0.895 to 0.950 for the education model (Table 2). CR values for the business and education models are ≥0.70. Construct reliability is considered satisfactory for all factors in both models (Al-Fraihat, Joy, Masadeh & Sinclair, 2020). Furthermore, the validity of the models based on Convergent and Discriminant Validity was analyzed. The obtained results depicted in Table 2 indicate that the average variance extracted from AVE is above the recommended value of ≥0.50 (Urbach & Ahlemann, 2010). Also, all values of discriminant validity are above 0.80 in both models, thereby confirming discriminant validity because it satisfies the condition that it must be larger than inter-construct correlations. Therefore, convergent and discriminant validity was achieved because all investigated items were above the recommended values (Al-Fraihat, Joy, Masadeh & Sinclair, 2020; Fornell & Larcker, 1981).

Table 2
The measurement model of Business and Education

Constructs	Business (n=468)					Education (n=882)				
	Standardized loading	AVE	Discriminant validity	CR	α	Standardized loading	AVE	Discriminant validity	CR	α
Individual Impact										
II_1	0.929					0.922				
II_2	0.949	0.879	0.938	0.967	0.975	0.843	0.723	0.850	0.912	0.895
II_3	0.961					0.849				
II_4	0.911					0.781				
Collaboration Quality CQ_1	0.939					0.811				
CQ_2	0.971	0.929	0.964	0.981	0.982	0.909	0.761	0.872	0.927	0.902
CQ_3	0.968					0.856				
CQ_4	0.977					0.910				
Information Quality										
IQ_1	0.941					0.799				
IQ_2	0.974	0.927	0.963	0.981	0.975	0.912	0.702	0.838	0.903	0.902
IQ _3	0.988					0.907				
IQ _4	0.948					0.714				

Constructs	Business (n=468)					Education (n=882)				
	Standardized loading	AVE	Discriminant validity	CR	α	Standardized loading	AVE	Discriminant validity	CR	α
System Quality										
SQ_1	0.972					0.899				
SQ _2	0.976	0.934	0.966	0.977	0.977	0.941	0.784	0.885	0.916	0.899
SQ _3	0.951					0.812				
Usefulness										
U_1	0.935					0.802				
U_2	0.920					0.803				
U_3	0.916					0.844				
U_4	0.973	0.903	0.950	0.987	0.988	0.878	0.694	0.833	0.948	0.950
U_5	0.971					0.843				
U_6	0.948					0.801				
U_7	0.961					0.872				
U_8	0.975					0.817				
User Satisfaction										
S_1	0.986	0.880	0.938	0.984	0.981	0.962	0.870	0.933	0.953	0.950
S_2	0.987					0.923				
S_3	0.955					0.913				

The introduced values in the correlation matrix (Table 3) represent the strength of the correlations between each factor (Hair et al., 2016). In Table 3, the data of the business model are below the main diagonal, while the data of the education model are presented above the diagonal. All values of mutual correlation have statistical significance, which confirms all correlation relations among latent variables.

Table 3

Correlation matrix Business vs Education

Relations	CQ	IQ	SQ	II	U	S
CQ	**1**	0.762	0.903	0.786	0.875	0.823
IQ	0.954	**1**	0.841	0.823	0.790	0.791
SQ	0.949	0.967	**1**	0.783	0.838	0.825
II	0.968	0.948	0.950	**1**	0.798	0.814
U	0.966	0.955	0.957	0.979	**1**	0.838
S	0.947	0.951	0.954	0.960	0.965	**1**

All analyzed fit indexes for the business model ($\chi 2/df=1.268$, CFI=0.96, RMSEA=0.097, NFI=0.90, IFI=0.97, and TLI=0.95) and for the education model ($\chi 2/df=1.321$, CFI=0.99, RMSEA=0.04, NFI=0.90, IFI=0.99, and TLI=0.98) were indicative of a good fit of the model (Table 4). Furthermore, all the analyzed data in the measurement model was adequate to extend the analysis in the structural model.

Table 4

Fit index measurement Business VS Education based on the measurement model

Model	χ^2 / df	CFI	RMSEA	NFI	IFI	TLI
Business	1.268	0.964	0.097	0.900	0.965	0.953
Education	1.321	0.985	0.042	0.904	0.985	0.981
Recommended value	≤≤3.00	≥≥0.90	≤≤0.05	≥≥0.90	≥≥0.90	≥≥0.90

Testing of the structural model

The potential relationships between the constructs were examined, and the structural model was tested after the validation of the measurement model. The structural model has been assessed using the significance and relevance of the structural model relationships at level ($p<0.05$); estimate the level of R2 (0.19 - weak; 0.33 - moderate; and 0.67 substantial) and estimate the fit index of the model (the recommended criteria for goodness-of-fit are as follows: χ^2 /df ≤3.00; CFI≥0.90, RMSEA≤0.05, NFI≥0.90, IFI≥0.90; TLI≥0.90) (Hair, Black, Babin & Anderson, 2010) as well as the regression coefficients (β-path coefficients could have positive or negative values, and recommended values of t-test >1.96) (Weston, 2006).

For the business users (Table 5), the standardized loadings of the II, the CQ, the IQ, the SQ, the U, and the S ranged from 0.92 to 0.98, 0.95 to 0.98, 0.94 to 0.99, 0.80 to 0.89, and from 0.95 to 0.91, respectively. For the second model that investigates education users (Table 5), the standardized loadings are smaller but not insignificant. The amounts for II, the CQ, the IQ, the SQ, the U, and the S ranged from 0.73 to 0.85, 0.83 to 0.93, 0.70 to 0.91, 0.80 to 0.89, and from 0.83 to 0.94, respectively. The distributed values show the high relative importance of all constructs.

Table 5
The structural model of Business and Education

Constructs	Business			Education		
	Standardized loading	t-value	R^2	Standardized loading	t-value	R^2
Individual Impact	0.920-0.979	13.082-14.977	/	0.730-0.853	7.524-8.720	/
Collaboration Quality	0.945-0.975	16.500-17.246	0.990	0.832-0.925	10.467-12.236	0.830
Information Quality	0.943-0.991	12.625-15.441	0.942	0.698-0.919	7.587-8.703	0.896
System Quality	0.949-0.979	16.865-21.458	0.968	0.801-0.914	10.914-14.370	0.919
Usefulness	0.797-0.889	9.302-10.803	0.989	0.797-0.889	9.302-10.803	0.889
User Satisfaction	0.952-0.991	18.939-29.988	0.952	0.825-0.944	12.449-16.903	0.759

Both models had a good fit with the data, as depicted in Table 6. Hence, the hypothesized model demonstrated a good fit with the sample data.

Table 6
Fit index measurement Business VS Education based on the structural model

Model	χ^2 / df	CFI	RMSEA	NFI	IFI	TLI
Business	2	0.917	0.140	0.910	0.918	0.904
Education	1.486	0.951	0.072	0.908	0.952	0.943
Recommended value	≤≤3.00	≥≥0.90	≤≤0.05	≥≥0.90	≥≥0.90	≥≥0.90

The research model for business users is represented in Figure 2, while the research model for education users is represented in Figure 3. In Table 5, the coefficient of

determination (R2) is used to measure the explained variance of the latent dependent variables relative to the total variance (Al-Fraihat, Joy, Masadeh & Sinclair, 2020). It is assessed that the predictors of Satisfaction explain 95.2 % of its variance (respectively, 4.8% of the variance is unexplained) in the research model of business users. Furthermore, it is estimated that the predictors of Satisfaction are explained in the research model of education users with 75.9% of the variance, while 24.1 % of the variance is unexplained.

In the next step, the hypotheses were tested. All the obtained results of the tested hypotheses are represented in Table 7 for both research models, as well as in Figure 2 for the business research model and in Figure 3 for the education research model. All estimates of the pathway (β) were applied in a standardized format (Table 7).

Table 7
Path analysis - Business vs Education

Path coefficients	Beta coefficient	T-value	Causal relations
Business			
H1a: II→CQ	0.995	12.747*	Supported
H2a: II→IQ	0.971	12.279*	Supported
H3a: II→SQ	0.984	13.377*	Supported
H4a: CQ→U	0.577	3.731*	Supported
H5a: IQ→U	0.009	0.098	No-supported
H6a: SQ→U	0.414	2.932*	Supported
H7a: U→S	0.976	19.440*	Supported
Education			
H1b: II→CQ	0.911	7.631*	Supported
H2b: II→IQ	0.947	6.720*	Supported
H3b: II→SQ	0.959	8.715*	Supported
H4b: CQ→U	0.612	3.491*	Supported
H5b: IQ→U	0.448	3.331*	Supported
H6b: SQ→U	-0.084	-0.396	Rejected
H7b: U→S	0.939	9.798*	Supported

*Significant at the 99% level

Individual Impact (II) has a positive impact on Cooperation Quality (CQ) regarding both groups of users, indicating that learners intend to use e-learning since it is perceived as useful in achieving their goals (β[business]=0.995, t=12.747; β[education]=0.911, t=7.631) with statistical significance p=0.000 in both cases. Also, Individual Impact has a positive impact on Information Quality (IQ) (β[business]=0.971, t=12.279; β[education]=0.947, t=6.720) and is thus significant at the 0.000 level of significance. Furthermore, Individual Impact has a positive impact on System Quality (SQ) in both groups of users by indicating a strong connection (β[business]=0.984, t=13.377; β[education]=0.959, t=8.715). Hence, Cooperation Quality has a positive impact on Usefulness (U) (β[business]=0.577, t=3.371; β[education]=0.612, t=3.491). In the case of education users, Information Quality (β[business]=0.009, t=0.098; β[education]=0.448, t=3.331) has a positive impact, but in the case of business users, this impact is at a negligibly small level. Behind that, System Quality has a positive impact on usefulness only in the case of business users (β[business]=0.414, t=2.932), while in the case of

education users, it has no positive impact (β[education]=-0.084, t=-0.396). Finally, the Usefulness of e-learning has a positive influence on User Satisfaction (S) in the case of both groups of users (β[business]=0.976, t=19.440; β[education]=0.939, t=9.798).

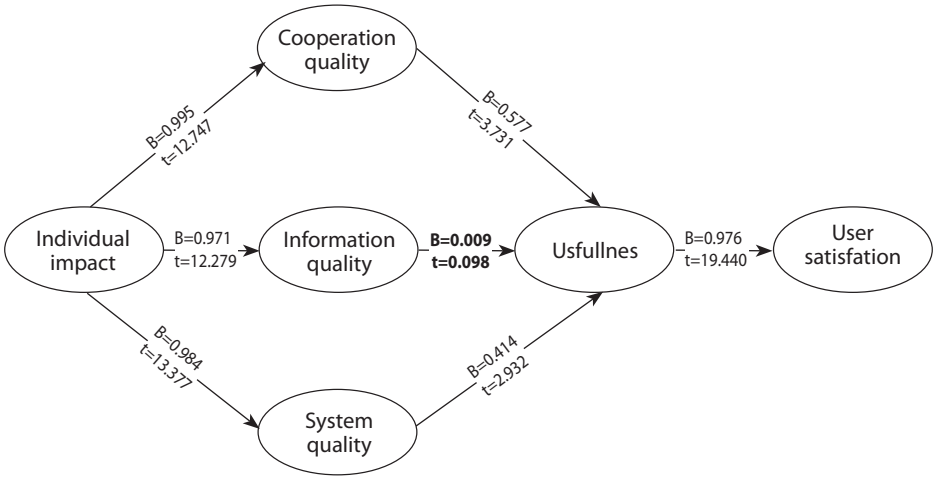

Figure 2. Structural model of e-learning in the business context

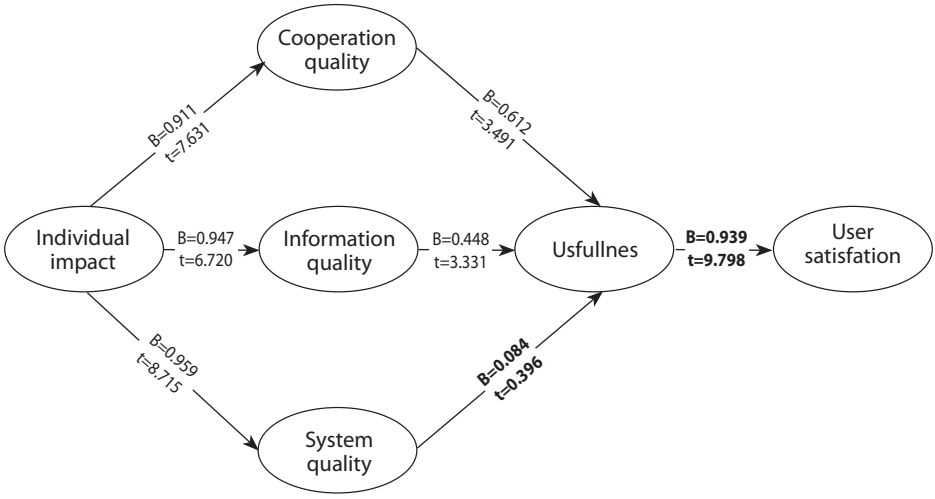

Figure 3. Structural model of e-learning in the education context

Discussion

According to the demographic analysis, it can be observed that youth dominate this research. That is because that population is innovative, easily adopts changes and new ideas, and widely uses e-learning systems in education and/or business environments. They find such a way of learning quickly accessible and easy to share and follow.

In this research, 7 hypotheses were developed and tested, and each of them is divided into "a" and "b" hypotheses. Hypotheses "a" refer to respondents who use e-learning

for business purposes, and "b" hypotheses relate to respondents who use this learning for educational purposes. The model is based on six constructs: Individual Impact, Cooperation Quality, Information Quality, System Quality, Usefulness of e-learning, and User Satisfaction. Based on the obtained values of path analysis, it could be concluded that all hypotheses in the research model of business users are accepted except hypothesis H5a (Information Quality→Usefulness), which is no-supported. Also, in the research model of education users, all hypotheses are supported, excluding hypothesis H6b (System Quality→Usefulness), which is rejected.

Firstly, Individual Impact was observed as a predictor of three constructs. The first hypotheses (H1a and H1b) observe the relation Individual Impact→Cooperation Quality, and both are supported. If someone performs tasks faster and easier, achieves higher productivity, and feels the benefits of this way of learning in a business and educational environment, it can be assumed that he or she would be motivated to be more involved in interaction and communication with other students. This finding is compatible with the research of Polancic et al. (2010), Schmitz et al. (2016), Saeed et al. (2010), and Chuang et al. (2012). Hypotheses H2a and H2b that observe the relationship Individual Impact→Information Quality are also confirmed. It could be explained that users who feel the positive individual impact of e-learning in a business and educational environment will probably trust the information and see it as useful and entertaining (Guimaraes & Igbaria, 1997; Jeyaraj, 2019; Sun, Fang & Hsieh, 2014). The third group of hypotheses (H3a and H3b) that observe the relationship Individual Impact→System Quality are proven. E-learning users who believe that they achieve individual benefits through it highly value the quality of the system, emphasizing good organization, accessibility, and ease of use. A similar conclusion is drawn by Schmitz et al. (2016). The opposite direction of the same relationship was analyzed in the research of Cidral et al. (2018).

The impact of the Usefulness of e-learning was tested by three different predictors, and the following results were obtained: the relationship Cooperation Quality→Usefulness (H4a and H4b) was tested, and both hypotheses were confirmed. Learners who achieve good cooperation with other participants perceive a high level of e-learning Usefulness in terms of good communication and information exchange and the availability of various types of programs and applications. Such findings were also derived from the research carried out by Cidral et al. (2018). Similarly, Anaya and Boticario (2009) conclude that a deficiency of information within the collaboration process in e-learning environments impairs the quality of the learning process. When it comes to Information Quality, as one of the observed predictors of e-learning Usefulness, two hypotheses show different results with regard to the purpose of e-learning usage. While education users see that Information Quality contributes to the Usefulness of the e-learning process (H5b), in the business context, the relationship between those two constructs is not confirmed (H5a). Although many studies indicate the importance of Information Quality for the Usefulness of e-learning systems (Mohammadi & Abrizah,

2015; Pow & Li, 2015; Zwain, 2019), none of them consider the difference between business and education usage. Users of e-learning for business purposes do not process the external information to the extent that education users do. External information that is used in the business context is often the subject of procedural reviews and monitoring, while users in the education area have to rely on information that might be of lower quality. Finally, the sixth group of hypotheses that measure the relation System Quality→Usefulness also shows that there is a difference in the perception of users when it comes to this construct in business and education contexts. Contrary to the business purpose (H6a), the hypothesis (H6b) that observes this relation in the educational purpose is not supported. According to previous literature reviews, System Quality mostly positively affected the perceived usefulness of e-learning in both cases (Alsabawy, Cater-Steel & Soar, 2016; Liaw & Huang, 2013; Rui-Hsin & Lin, 2018). However, recently, this claim in the education context has not been confirmed (Salloum, AlHamad, Al-Emran, Monem & Shaalan, 2019), which is in line with the result of this study. This can be explained by the fact that e-learning in education in Serbia is still in the development phase and has not been efficiently institutionally organized until the COVID-19 period when everyone has been getting online. Therefore, the quality of the system based on effective technical support such as ease of use, good organization, and fast access is not experienced as a good contributor to e-learning usefulness by students. On the other hand, the business-oriented learners recognized the quality of the system as an important predictor of usefulness. Organizations that use certain platforms for employee training have a smaller number of participants in comparison with education institutions, and the quality of the e-learning system is easily managed and technically supported. Business organizations are more willing to invest in technological solutions to secure data and ensure the reliability of the system, avoiding technical interruptions, rather than using open-source light versions with a lower level of usefulness.

The last set of hypotheses (H7a and H7b) observes the relation Usefulness→Satisfaction. In both contexts—business and education—the assumed hypotheses are supported. A feature of the usefulness of e-learning that affects the user's satisfaction while using the e-learning system refers to a good exchange of information and documents as well as the possibility of using various types of programs and applications. The same conclusion was obtained by Al-Samarraie et al. (2018) and Hammouri and Abu-Shanab (2018).

Conclusion

Although today's internet environment enables networking and the current connection of a large number of interested parties, both from academia and the business community, it is increasingly important to explore and explain the individual influence of each participant. This is significant because fulfilling individual needs can lead to an increase in personal satisfaction. Research that this study relies on indicates the importance of user satisfaction as a prerequisite for achieving high quality in the learning system. This

research contributes to the dual observation of the expectations and attitudes of both members of the education and business environments. This is valuable for defining the quality of the system that will give adequate "fruit" for tomorrow.

The main purpose of the paper is to establish quality indicators as influences on e-learning user satisfaction in business and educational contexts. To enable deeper insight into understanding the quality of e-learning for different purposes, two research models were compared to determine influencing factors of user satisfaction.

According to the results of this research, important differences can only be observed in the relationships between Information Quality and System Quality according to the Usefulness of e-learning. The quality of information does not have a positive impact on usefulness in the business context, unlike in the educational context, where a strong positive connection is noticed. Another difference refers to the connection between the constructs of System Quality and Usefulness, where the application of e-learning in the educational environment has a negative impact.

In order to overcome the literature gap, the paper measures quality indicators of e-learning that impact user satisfaction in both educational and business environments. Such a theoretical and empirical contribution leads to significant practical implications for the conclusions made in this study. A deeper overview and understanding of factors influencing customer satisfaction could help managers in both environments (business and education) identify where challenges with the quality of e-learning lie. This could enable organizations to identify priorities for quality improvement and increase user satisfaction, thus increasing their competitiveness.

The limitations of this research are reflected in the sample size and homogeneity. Hence, future research can be extended to countries in the region. Further research could encompass societies at different levels of development and achievements in the digital transformation process.

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Pokazatelji kvalitete e-učenja: poslovanje naspram obrazovanja

Sažetak

U današnje vrijeme tehnološka revolucija donosi značajne promjene u svim sferama društva uključujući učenje u poslovnom i obrazovnom okružju. Posljedično, kvaliteta i korisnost sustava za e-učenje dobivaju važnost u suvremenom konkurentnom tržištu. Kako bi se povećalo zadovoljstvo korisnika, organizacije moraju uložiti više napora u identificiranje i razumijevanje značajnih utjecajnih čimbenika. Ovo istraživanje nastoji uspostaviti pokazatelje kvalitete kao čimbenike koji utječu na zadovoljstvo korisnika e-učenja uspoređujući poslovni i obrazovni kontekst. Rezultati prikupljeni putem 1350 važećih upitnika procjenjuju se korištenjem modeliranja strukturnih jednadžbi (SEM). Konceptualni jemodel razvijen i sastoji se od šest pokazatelja kvalitete: individualni učinak, kvaliteta suradnje, kvaliteta informacija, kvaliteta sustava, korisnost i zadovoljstvo. Razmatrajući odnose između kvalitete informacija i kvalitete sustava prema korisnosti e-učenja, nalazi ukazuju na važne razlike između obrazovanja i percepcije poslovnih korisnika. Ovo istraživanje doprinosi dualnom promatranju očekivanja i stavova promatranih skupina ispitanika.

Ključne riječi: *e-učenje; obrazovanje; pokazatelji kvalitete; poslovanje; zadovoljstvo.*

Uvod

U današnje vrijeme internet utječe na civilizaciju u kojoj „sve i svatko postaje online", omogućujući tvrtkama da „prate svoje performanse i online ponašanje te prilagode komunikaciju, proizvode i usluge svojim korisnicima" (Navimipoura i Soltanib, 2016, str. 1052). Posljednjih godina povećano korištenje interneta i informacijskih tehnologija toliko je poraslo da je dovelo do tehnološke revolucije. Ova je revolucija utjecala na veliki broj industrija, uključujući i obrazovni sustav, pri čemu postoji nekoliko oblika korištenja internetskih tehnologija u obrazovanju. Na primjer, Dominici i Palumbo (2013) ukazuju da e-učenje nije jednako sveprisutnom učenju (u-učenju) i učenju na daljinu. Učenje na daljinu je oblik obrazovanja u kojem učenici možda neće uvijek fizički nazočiti nastavi (Kaplan i Haenlein, 2016). To je „jedan element e-učenja" i „nije glavni činilac razlike", dok se u-učenje odnosi na mogućnost učenja bilo gdje (Dominici i Palumbo, 2013, str. 88). U ovoj se studiji e-učenje definira kao pouka koja se odvija putem digitalnih uređaja namijenjenih promoviranju i unaprjeđenju

kvalitete učenja (Mayer, 2017) kroz „omogućavanje pristupa resursima i uslugama" i „omogućavanje razmjene i suradnje na daljinu" (Navimipour i Zareie, 2015, str. 475). To predstavlja opravdano rješenje za izbjegavanje problema povezanih s fizičkom mobilnosti, dopuštajući studentima/korisnicima da prate pojedinačne *online* tečajeve unutar svojih domova.

Prema saznanjima autora, manji broj radova bavio se percepcijom e-učenja u poslovnom okružju (Demirkan i sur., 2010; Koohang i Harman, 2007; Poór i sur., 2020; Sambhanthan i Potdar, 2017), posebno u usporedbi s njegovom primjenom u obrazovne svrhe. Calvo i Villarreal (2018) navode da su rješenja za e-učenje u poduzećima, posebice u obrazovnim ustanovama, široko prihvaćena na tržištu. Iako se ove teme uglavnom odnose na zadovoljstvo učenika i osoblja i korisnost e-učenja u obrazovanju (Alsabawy i sur., 2016; Al-Samarraie i sur., 2018; Cheok i Wong, 2015; Hammouri i Abu-Shanab, 2018), neke studije ističu poslovne aspekte e-učenja (Demirkan i sur., 2010; Koohang i Harman, 2007). Neki od njih su održivost i tržišnost sustava, kao i odnos troškova i učinkovitosti. Sambhanthan i Potdar (2017) naglašavaju poduzetničku perspektivu e-učenja u poslovanju, ukazujući na upravljačke, ekonomske i uslužno orijentirane aspekte.

Informacije o zadovoljstvu korisnika od velike su važnosti za organizacije orijentirane na pružanje usluge korisnicima (Andrea i sur., 2020) jer se prednosti e-učenja temelje na zadovoljstvu korisnika i čimbenicima koji na njega utječu. U kontekstu e-učenja, obično su proučavani zadovoljstvo korisnika i njegovi odnosi s drugim varijablama (Hong i sur., 2017; Pham i sur., 2019; Shahzad i sur., 2020). Zadovoljstvo je povezano s time kako korisnici osjećaju da sustav e-učenja ispunjava njihove potrebe ili očekivanja (Harrati i sur., 2016) i „to je mjera uspješne interakcije između informacijskog sustava i njegovih korisnika" (Kurt, 2019, str. 1176). Pozitivan utjecaj između kvalitete usluge i zadovoljstva korisnika potvrđen je kroz nekoliko studija (Budianto, 2019), pri čemu se kvaliteta usluge vidi kao preduvjet zadovoljstva korisnika (Ekinci, 2003) i obrnuto (Cronin i Taylor, 1992). Uzimajući u obzir prethodno navedeno, cilj je rada utvrditi pokazatelje kvalitete značajne za zadovoljstvo korisnika e-učenja uspoređujući različite svrhe korištenja - poslovne naspram obrazovnih.

Sljedeće poglavlje posvećeno je relevantnoj literaturi o zadovoljstvu korisnika u okružju e-učenja, kao i čimbenicima koji izravno ili neizravno utječu na ovu izlaznu varijablu. Sukladno tome, razvijene su predložene hipoteze. Treći i četvrti dio predstavljaju statističku metodologiju, rezultate i raspravu, a potom i zaključne napomene.

Teorijski okvir

U poslovnom okružju sustav e-učenja važan je alat za upravljanje koji se može koristiti za poboljšanje učinkovitosti procesa korporativnoga znanja i razvoja zaposlenika (Emilova, 2016). Glavna je namjera obrazovanja pomoći poduzećima i uputiti učenike u industriju (Traxler, 2018). Nedavno su Poór i sur. (2020) istraživali korištenje e-učenja i njegove praktične implikacije u organizacijama. Općenito su zaključili da veliki broj

tvrtki i institucija nije prihvatio e-učenje zbog nedostatka motivacije i zbog toga što nisu vidjeli koristi. Osim toga, isti autori smatraju da se e-učenje koristi uglavnom za poučavanje profesija tzv. *bijelih ovratnika* (engl. *white-collars)* i u manjoj mjeri za poučavanje profesija tzv. *plavih ovratnika* (engl. *blue-collars*), ističući da je njegova primjena najveća u javnim organizacijama. Konačno, Poór i sur. (2020, str. 10) nalaze da „ne postoji značajna korelacija između obrazovnih institucija i korištenja e-učenja". S druge strane, Lalić i sur. (2017) navode različite koristi od e-učenja u proizvodnji, poput toga da zaposlenik neovisno čita materijal postavljen na računalu, samoprovjere stečenoga znanja, interakcije s drugim sudionicima, kontrole nad učenjem i smanjenih troškova poučavanja.

U literaturi o e-učenju često se koristi pojam kvalitete jer je to jedan od ključnih izazova za teorijsku i praktičnu upotrebu, kako bi e-učenje postalo važno koliko i tradicionalno (Ehlers, 2004). Kvaliteta, kao ključna odrednica konkurentnosti, može se definirati i mjeriti u skladu sa zahtjevima tržišta kroz mišljenje korisnika o očekivanoj i percipiranoj izvedbi usluga ili proizvoda (Danish i sur., 2018). Nekoliko je studija dokazalo postojanje pozitivne korelacije između kvalitete usluge i zadovoljstva korisnika (Budianto, 2019). Nadalje, zadovoljstvo korisnika djeluje kao ključni prediktor njihove lojalnosti (Cheng i sur., 2011) i povjerenja (Dabholkar i Sheng, 2012), kao i povjerenja koje imaju prema pružateljima usluga (Boshoff i duPlessis, 2009). Također, moglo bi se reći da zadovoljstvo korisnika pozitivno utječe na njihovu buduću namjeru naručivanja proizvoda ili usluge (Huddleston i sur., 2009). Zadovoljstvo korisnika također se smatra utjecajnim čimbenikom u financijskim rezultatima organizacije i troškovima povezanim s uvjeravanjem korisnika i pružanjem pogodnosti za njih (Lim i sur., 2020). Cheng i sur. (2011) dalje tvrde da je zadovoljstvo korisnika važno kao mjera njihova ponašanja i ključni pokazatelj poslovne učinkovitosti (Sandada, 2013). Zbog toga su informacije o zadovoljstvu korisnika od velike važnosti za uslužno orijentirane organizacije, pri čemu je percepcija kvalitete od strane korisnika u značajnoj mjeri povezana s fazom korištenja proizvoda i usluga (Andrea i sur., 2020), povezanom s njihovom učinkovitosti i efikasnosti. Posljedično, ključ je uspjeha organizacije njezina sposobnost kontinuiranoga slušanja zahtjeva njezina okružja (Lam i sur., 2017), odnosno svojih korisnika (Storey i Larbig, 2018).

U današnje vrijeme, sve veća uporaba digitalnih tehnologija promijenila je način poslovanja, uključujući i područje obrazovanja (Dominici i Palumbo, 2013). Isti autori istaknuli su da je osim e-učenja za studente, korporativno osposobljavanje još jedna važna ciljna grupa za pružatelje usluga e-učenja. U oba slučaja, u posljednjem desetljeću, razvoj visokokvalitetnih sustava za e-učenje postao je ključan za ispunjavanje zahtjeva korisnika jer je pravi cilj svakog poslovanja zadovoljiti potrebe koje pokreću zadovoljstvo korisnika (Dominici i Palumbo, 2013). Stoga se pokazalo da je zadovoljstvo korisnika važan pokretač konkurentnosti i u e-poslovanju također (Gerasimenko i Razumova, 2020; Navimipoura i Soltanib, 2016). Postoji značajan odnos između kvalitete e-usluga i zadovoljstva korisnika, kao i zadovoljstva korisnika i namjere kupnje (Dhingra i

sur., 2020). S prikupljenim i analiziranim informacijama od korisnika, tvrtke mogu donositi bolje odluke (Mahdavi i sur., 2011). Međutim, zadovoljstvo korisnika ne smije se promatrati samo kao razlika u odnosu na konkurenciju, već se također treba smatrati poslovnom filozofijom koja nastoji upravljati njihovim očekivanjima i biti u stanju odgovorno zadovoljiti njihove potrebe (Dominici i Palumbo, 2013). Isti autori dokazali su praktične implikacije za obrazovne ustanove i druge tvrtke koje se koriste sustavima za e-učenje utemeljenim na pristupu usmjerenom na korisnika. Ho i Dzeng (2010) navode da su ne samo obrazovne institucije negoi poduzeća također počela često pokretati *online* poučavanje putem interneta, kako bi smanjili troškove poučavanja.

Individualni utjecaj

Velik broj prethodnih istraživanja posvetio je značajnu pažnju individualnom utjecaju i njegovom odnosu s informacijskim sustavom (Chuang i sur., 2012; Saeed i sur., 2010; Wu i Wang, 2006). Neki od tih odnosa bili su pozitivni (Burton-Jones i Straub, 2006), dok su neki bili negativni (Yoon i Guimaraes, 1995). U oba slučaja ovakvi rezultati upućuju na potrebu za istraživanjem individualnoga utjecaja na korištenje sustava (Jeyaraj, 2019), kao i njegovih elemenata, suradnje, informacija i kvalitete. Individualni utjecaj odnosi se na prednosti koje netko ostvaruje kao posljedicu korištenja sustava (DeLone i McLean, 1992; Jeyaraj, 2019). Individualni utjecaj korišten je za predstavljanje različitih značajki kao što su izvedba sustava ili kvaliteta sustava (Schmitz i sur., 2016), suradnja (Polancic i sur., 2010) i zadovoljstvo informacijskim sustavom (Guimaraes i Igbaria, 1997; Sun i sur., 2014). Stoga su postavljene sljedeće hipoteze:

Hipoteza 1a. Individualni utjecaj pozitivno utječe na Kvalitetu suradnje između ispitanika koji se koriste e-učenjem u poslovanju.

Hipoteza 1b. Individualni utjecaj pozitivno utječe na Kvalitetu suradnje među ispitanicima koji se koriste e-učenjem u obrazovanju.

Hipoteza 2a. Individualni utjecaj pozitivno utječe na Kvalitetu informacija kod ispitanika koji se koriste e-učenjem u poslovanju.

Hipoteza 2b. Individualni utjecaj pozitivno utječe na Kvalitetu informacija kod ispitanika koji se koriste e-učenjem u obrazovanju.

Hipoteza 3a. Individualni utjecaj pozitivno utječe na Kvalitetu sustava među ispitanicima koji se koriste e-učenjem u poslovanju.

Hipoteza 3b. Individualni utjecaj pozitivno utječe na Kvalitetu sustava među ispitanicima koji se koriste e-učenjem u obrazovanju.

Kvaliteta suradnje

E-učenje omogućuje laku komunikaciju među polaznicima što je važna stavka kvalitete suradnje. Kvaliteta komunikacije tumači se kao „mišljenje korisnika o stupnju do kojeg dobavljač informira svoje uobičajene klijente putem komunikacijskih sredstava" (Odekerken-Schroder i sur., 2003). Mnoge odrednice odnose se na kvalitetu suradnje, poput kvalitete usluge i kvalitete odnosa (Wu i sur., 2013). Nadalje, Urbach i sur. (2010)

ističu korisnost i zadovoljstvo korisnika kao značajnu odrednicu kvalitete suradnje dok Cidral i sur. (2018) promatraju odnos između determinanti kvalitete suradnje i korisnosti. Stoga se predlažu sljedeće dvije hipoteze:

Hipoteza 4a. Kvaliteta suradnje pozitivno utječe na Korisnost kod ispitanika koji se koriste e-učenjem u poslovanju.

Hipoteza 4b. Kvaliteta suradnje pozitivno utječe na Korisnost kod ispitanika koji se koriste e-učenjem u obrazovanju.

Kvaliteta informacija

U današnjem e-okružju informacije se dodaju na mrežu nevjerojatnom brzinom pri čemu kvaliteta tih informacija značajno varira (Pow i Li, 2015). Zwain (2019) dokazao je kvalitetu informacija kao jedan od prediktora prihvaćanja internetskih tehnologija od strane korisnika u učenju. U skladu s tim, kvaliteta informacija može se uzeti u obzir za uspješnu upotrebu resursa za učenje na mreži (Mohammadi i Abrizah, 2015). Isti su autori ispitivali dimenzije kvalitete informacija i zaključili da je većina njih povezana s kvalitetom sadržaja, kao što su provjerljivost, točnost, informativnost, ponovno korištenje, potpunost, pravovremenost i objektivnost. Alkhattabi i sur. (2011) razmatraju dimenzije kvalitete grupirane u tri čimbenika kvalitete: intrinzičnu, kontekstualnu zastupljenost i dostupnost. Razmatrajući učinak kvalitete informacija na zadovoljstvo korisnika (Demissie i Rorissa, 2019; Kurt, 2019), moglo bi se zaključiti da percepcija korisnika o kvaliteti internetskih informacija utječe na njihovu upotrebu takvih informacija u procesu učenja (Pow i Li, 2015). Stoga su razvijene sljedeće hipoteze:

Hipoteza 5a. Kvaliteta informacija pozitivno utječe na Korisnost kod ispitanika koji se koriste e-učenjem u poslovanju.

Hipoteza 5b. Kvaliteta informacija pozitivno utječe na Korisnost kod ispitanika koji se koriste e-učenjem u obrazovanju.

Kvaliteta sustava

U radu Chopra i sur. (2019), vidljivo je da varijable koje se koriste za kvalitetu sustava variraju. U ovoj studiji, kvaliteta sustava primarno je usmjerena na tehničke aspekte kao što su jednostavnost korištenja, dostupnost (Al-Fraiha i sur., 2019; Elkaseh i sur., 2016; Liaw, 2008; Mohammadi, 2015) i dobro organiziran sustav e-učenja (Ozkan i Koseler, 2009).

Odgovarajuća kvaliteta sustava omogućuje učenicima „da pristupe tečajevima ili materijalima za učenje bez poteškoća" (Chopra i sur., 2019, str. 3). Kvaliteta sustava često se doživljava kao determinanta percipirane korisnosti (Alsabawy i sur., 2016; Liaw i Huang, 2013) i pretpostavlja se da utječe na zadovoljstvo korisnika (Demissie i Rorissa, 2019; Kurt, 2019). Osim toga, istraživanje provedeno u poslovnom kontekstu također pokazuje da, među ostalim, kvaliteta sustava pozitivno djeluje na percipiranu korisnost e-učenja (Rui-Hsin i Lin, 2018). S druge strane, ispitanici koji koriste e-učenje

u obrazovanju „kvaliteta sustava nije pokazala značajan učinak na percipiranu korisnost" (Salloum i sur., 2019). Stoga, trenutačna studija pretpostavlja da:

Hipoteza 6a. Kvaliteta sustava pozitivno utječe na Korisnost kod ispitanika koji se koriste e-učenjem u poslovanju.

Hipoteza 6b. Kvaliteta sustava pozitivno utječe na Korisnost kod ispitanika koji se koriste e-učenjem u obrazovanju.

Korisnost e-učenja

Korisnost se karakterizira kao način gledanja koji se razvija u dugoročnoj percepciji iskustva usluge, a najbolje se procjenjuje mjerenjima temeljenim na učinku (Cronin i Taylor, 1992). U kontekstu e-učenja, korisnost se definira kao razina do koje korisnici vjeruju da bi korištenje određenoga sustava poboljšalo njihov posao/učenje (Davis, 1989). Prema ISO 9241, korisnost je definirana kao „mjera u kojoj određeni korisnici mogu koristiti proizvod za postizanje određenih ciljeva uz učinkovitost, djelotvornost i zadovoljstvo u određenom kontekstu uporabe" (Jović i sur., 2017). Kada korisnici vide e-učenje kao korisno za stjecanje vještina i znanja, oni su spremniji koristiti ovaj sustav (Cheok i Wong, 2015). Pretpostavlja se da percipirana korisnost pozitivno utječe na zadovoljstvo korisnika (Aparicio i sur., 2017; Lee, 2010; Mtebe i Raphael, 2018; Sun i sur., 2008), stoga može poboljšati učinkovitost e-učenja (Alsabawy i sur., 2016) i samoregulacija učenika (Liaw i Huang, 2013). S druge strane, Liaw i Huang (2013., str. 21) nalaze da je „percipirano zadovoljstvo pozitivno povezano s percipiranom korisnošću". Kad je riječ o usluzi e-učenja, pokazalo se da su kvaliteta informacija, kvaliteta sustava i korisnost jedni od ključnih čimbenika koji utječu i na zadovoljstvo korisnika (Al-Samarraie i sur., 2018; Hammouri i Abu -Shanab, 2018). Stoga se postavljaju sljedeće hipoteze:

Hipoteza 7a. Korisnost pozitivno utječe na Zadovoljstvo korisnika među ispitanicima koji se koriste e-učenjem u poslovanju.

Hipoteza 7b. Korisnost pozitivno utječe na Zadovoljstvo korisnika kod ispitanika koji se koriste e-učenjem u obrazovanju.

U ovom istraživanju pretpostavljeni su čimbenici koji utječu na zadovoljstvo korisnika e-učenjem u obrazovnom i poslovnom kontekstu. Prema razvijenim hipotezama, model istraživanja prikazan je na Prikazu 1 pri čemu je zadovoljstvo korisnika predloženo kao zavisna varijabla s jednim neovisnim i četiri zavisna prediktora.

Slika 1.

Metodologija

Kako bi se ispitali različiti čimbenici koji utječu na zadovoljstvo korisnika pri korištenju različitih alata za e-učenje, istraživanje je provedeno u Srbiji u drugoj polovini 2019 godine. Istraživanje je obuhvatilo uglavnom mlade korisnike budući da su bili inovativniji, upoznati s tehnologijom i otvoreniji prema novim idejama od

starijih (Quoquab i sur., 2013). Prvu skupinu korisnika činili su oni koji su e-učenje koristili u poslovne svrhe, a drugu skupinu ispitanika koji su e-učenje koristili u obrazovne svrhe. Kako bi se smanjila pristranost i dobili ispitanici, korišteni upitnik bio je anoniman. U ovom istraživanju sudjelovalo je 1350 valjanih i potpunih odgovora. Za ocjenjivanje odgovora korisnika korištena je petostupanjska Likertova skala, pri kojoj 1 predstavlja potpuno se ne slaže, a 5 potpuno se slaže. Autori su koristili početni upitnik temeljen na prethodnim studijama (Cidral i sur., 2018; Urbach i sur., 2010). Upitnik se sastojao od dvije skupine pitanja. Prvi se dio sastojao od pitanja vezanih za demografske karakteristike ispitanika. Drugi dio ankete (26 pitanja) odnosio se na ispitivanje ključnih čimbenika koji utječu na e-učenje i uključivao je sljedeće pokazatelje kvalitete: individualni utjecaj e-učenja (II), suradnička kvaliteta e-učenja (CQ), kvaliteta informacija e-učenja (QI), kvalitete sustava (SQ), korisnosti e-učenja (U) i zadovoljstva korisnika (S). Za testiranje hipoteza u predloženom modelu zadovoljstva korisnika e-učenjem za analizu podataka korišteni su statistički paket za društvene znanosti (SPSS) i AMOS v.20.0.

Demografske karakteristike uzorka

Sociodemografske karakteristike sudionika sažete su u Tablici 1. U uzorku je bilo 73,3 % ispitanica i 26,7 % muškaraca u dobi od 17 do 30 godina (99,3 %). 89,3 % ispitanika izjavilo je da se koristi e-učenjem u svakodnevnom životu. Što se tiče svrhe korištenja e-učenja, 34,7 % ispitanika koristi se alatima za e-učenje u poslovne svrhe, a 65,3 % ispitanika koristi ih u obrazovne svrhe.

Tablica 1

Modeliranje strukturnih jednadžbi (SEM) je tehnika koja se koristi za analizu strukturnih odnosa (Nicolas i sur., 2020; Soh i sur., 2020; Weston, 2006). Posljednjih godina SEM metoda postaje sve popularnija u istraživanjima koja se bave e-učenjem (Al-Fraihat i sur., 2020; Amasha i AbdElrazek, 2016; Aparicio i sur., 2017; Cidral i sur., 2018). Stoga je SEM korišten u ovom istraživanju za testiranje predloženoga modela. Ova tehnika predstavlja kombinaciju višestruke regresijske analize i faktorske analize, a koristi se za analizu strukturalnoga odnosa između latentnih konstrukata i mjerenih varijabli (Byrne, 2016; Chin i Newsted, 1999). SEM se sastoji od dva podmodela: mjernoga modela za testiranje pouzdanosti i valjanosti i strukturnoga modela za testiranje hipoteza koji su predstavljeni u sljedećim koracima.

Procjena mjernoga modela

Mjerni model evaluiran je pomoću različitih mjera. Prvo, korištena je interna pouzdanost konzistentnosti temeljena na Cronbachovoj alfi (α) i vrijednostima kompozitne pouzdanosti (CR). Pokazatelji trebaju biti ≥0,70 (Hair i sur., 2010; Urbach i Ahlemann, 2010). Dobivene vrijednosti α kreću se od 0,975 do 0,988 za poslovni model i od 0,895 do 0,950 za obrazovni model (Tablica 2). CR vrijednosti za poslovni i obrazovni model su ≥ 0,70. Pouzdanost konstrukcije smatra se zadovoljavajućom za sve čimbenike u oba modela (Al-Fraihat i sur., 2020). Nadalje, analizirana je valjanost

modela temeljenih na konvergentnoj i diskriminantnoj valjanosti. Dobiveni rezultati prikazani u Tablici 2 pokazuju da je prosječna ekstrahirana varijanca AVE iznad preporučenih vrijednosti ≥ 0,50 (Urbach i Ahlemann, 2010). Također, sve vrijednosti diskriminantne valjanosti su iznad 0,80 u oba modela čime se potvrđuje diskriminantna valjanost jer zadovoljava uvjet da mora biti veća od interkonstruktnih korelacija. Stoga je postignuta konvergentna i diskriminirajuća valjanost jer su sve ispitane stavke bile iznad preporučenih vrijednosti (Al-Fraihat i sur., 2020; Fornell i Larcker, 1981).

Tablica 2

Uvedene vrijednosti u korelacijskoj matrici (Tablica 3) predstavljaju snagu korelacija između svakog faktora (Hair i sur., 2016). U Tablici 3 ispod glavne dijagonale su podaci poslovnog modela, a iznad dijagonale podaci obrazovnog modela. Sve vrijednosti međusobne korelacije imaju statističku značajnost, što potvrđuje sve korelacijske odnose među latentnim varijablama.

Tablica 3

Svi analizirani fit indeksi za poslovni model (χ^2/df = 1,268, CFI = 0,96, RMSEA = 0,097, NFI = 0,90, IFI = 0,97 i TLI = 0,95) i za obrazovni model (χ^2/df = 1,321, CFI = 0,99, RMSEA = 0,04, NFI = 0,90, IFI = 0,99 i TLI = 0,98) bili su indikativni za dobro uklapanje modela (Tablica 4). Nadalje, svi analizirani podatci u mjernom modelu bili su primjereni za proširenje analizom u strukturnom modelu.

Tablica 4

Ispitivanje strukturnoga modela

Ispitani su potencijalni odnosi između konstrukata, a strukturni model testiran je nakon provedbe validacije mjernoga modela. Strukturni model procijenjen je korištenjem značajnosti i relevantnosti odnosa strukturalnoga modela na razini ($p < 0,05$); procijeniti razinu R2 (0,19 - slabo; 0,33 – umjereno i 0,67 značajno) i procijeniti fit indekse modela (preporučeni kriteriji prilagodbe su sljedeći: χ^2/df ≤ 3,00; CFI ≥ 0,90, RMSEA ≤ 0,05, NFI ≥ 0,90, IFI ≥ 0,90; TLI ≥ 0,90) (Hair i sur., 2010) kao i koeficijenti regresije (koeficijenti β-putanje mogu imati pozitivne ili negativne vrijednosti, a preporučene vrijednosti t-testa > 1,96) (Weston, 2006).

Za poslovne korisnike (Tablica 5) standardizirana opterećenja II, CQ, IQ, SQ, U i S kretala su se od 0,92 do 0,98, 0,95 do 0,98, 0,94 do 0,99, 0,80 do 0,89 i od 0,95 do 0,91, respektivno. Za drugi model koji istražuje korisnike obrazovanja (Tablica 5) standardizirana opterećenja su manja, ali nisu beznačajna. Iznos za II, CQ, IQ, SQ, U i S kretao se od 0,73 do 0,85, 0,83 do 0,93, 0,70 do 0,91, 0,80 do 0,89 i od 0,83 do 0,94, respektivno. Distribuirane vrijednosti pokazuju visoku relativnu važnost svih konstrukata.

Tablica 5

Oba modela dobro su odgovarala podatcima prikazanim u Tablici 6. Stoga je hipotetski model pokazao dobro podudaranje s podatcima uzorka.

Tablica 6

Model istraživanja za poslovne korisnike prikazan je na Prikazu 2, dok je model istraživanja za korisnike obrazovanja predstavljen na Prikazu 3. U Tablici 5, koeficijent determinacije (R^2) koristi se za mjerenje objašnjene varijance latentnih zavisnih varijabli u odnosu na ukupnu varijancu (Al-Fraihat I sur., 2020). Procjenjuje se da prediktori zadovoljstva objašnjavaju 95,2 % njegove varijance (odnosno, 4,8 % varijance je neobjašnjivo) u modelu istraživanja poslovnih korisnika. Nadalje, procjenjuje se da su prediktori zadovoljstva objašnjeni u modelu istraživanja korisnika obrazovanja sa 75,9 % varijance, pri čemu je 24,1 % varijance neobjašnjeno.

U sljedećem koraku testirane su hipoteze. Svi dobiveni rezultati testiranih hipoteza prikazani su u Tablici 7 za oba modela istraživanja, kao i na Prikazu 2 za model poslovnoga istraživanja i na Prikazu 3 za model istraživanja obrazovanja. Sve procjene analize puta (β) primijenjene su u standardiziranom formatu (Tablica 7).

Tablica 7

Slika 2.

Slika 3.

Individualni utjecaj (II) ima pozitivan učinak na kvalitetu suradnje (CQ) s obzirom na obje skupine korisnika, što ukazuje na to da učenici namjeravaju koristiti e-učenje budući da se percipira kao korisno u postizanju njihovih ciljeva (β[poslovanje] = 0,995, t = 12,747; β[obrazovanje] = 0,911, t = 7,631) sa statističkom značajnošću p = 0,000 u oba slučaja). Također, individualni utjecaj ima pozitivan utjecaj na kvalitetu informacija (IQ) (β[poslovanje] = 0,971, t = 12,279; β[obrazovanje] = 0,947, t = 6,720) i stoga značajan na razini značajnosti od 0,000. Nadalje, individualni utjecaj ima pozitivan utjecaj na kvalitetu sustava (SQ) u obje skupine korisnika ukazujući na jaku vezu (β[poslovanje] = 0,984, t = 13,377; β[obrazovanje] = 0,959, t = 8,715). Dakle, kvaliteta suradnje ima pozitivan utjecaj na korisnost (U) (β[poslovanje] = 0,577, t = 3,371); β[obrazovanje] = 0,612, t = 3,491). U slučaju obrazovnih korisnika kvaliteta informacija (β[poslovanje] = 0,009, t = 0,098; β[obrazovni] = 0,448, t = 3,331) ima pozitivan utjecaj, no u slučaju poslovnih korisnika taj je utjecaj zanemariv zbog male razine. Iza toga, kvaliteta sustava ima pozitivan utjecaj na korisnost samo u slučaju poslovnih korisnika (β[poslovanje] = 0,414, t = 2,932) dok u slučaju korisnika obrazovanja nema pozitivan utjecaj β[obrazovanje] = -0,084, t = -0,396). Konačno, korisnost e-učenja pozitivno utječe na zadovoljstvo korisnika (S) u slučaju obje skupine korisnika (β[poslovanje] = 0,976, t = 19,440; β[obrazovanje] = 0,939, t = 9,798).

Rasprava

Prema demografskoj analizi uočava se da u ovom istraživanju dominiraju mladi. To je zato što je ta populacija inovativna, lako usvaja promjene i nove ideje te široko koristi sustave e-učenja u obrazovnom i/ili poslovnom okružju. Smatraju da je takav način učenja brzo dostupan, lak za dijeljenje i praćenje.

U ovom istraživanju razvijeno je i testirano 7 hipoteza, od kojih je svaka podijeljena na „a" i „b" hipotezu. Hipoteze „a" odnose se na ispitanike koji se koriste e-učenjem u poslovne svrhe, a hipoteze „b" odnose se na ispitanike koji se ovim učenjem koriste u obrazovne svrhe. Model se temelji na šest konstrukata: Individualni utjecaj, Kvaliteta suradnje, Kvaliteta informacija, Kvaliteta sustava, Korisnost e-učenja i Zadovoljstvo korisnika. Na temelju dobivenih vrijednosti analize puta može se zaključiti da su sve hipoteze u modelu istraživanja poslovnih korisnika prihvaćene osim hipoteze H5a (Kvaliteta informacija → Korisnost) koja nije podržana. Također, u modelu istraživanja korisnika obrazovanja podržane su sve hipoteze, osim hipoteze H6b (Kvaliteta sustava → Korisnost) koja je odbačena.

Prvo, Individualni utjecaj promatran je kao prediktor za tri konstrukta. Prve hipoteze (H1a i H1b) promatraju odnos Individualni učinak → Kvaliteta suradnje i obje su podržane. Ako netko brže i lakše obavlja zadatke, postiže veću produktivnost i osjeća dobrobiti ovakvoga načina učenja u poslovnom i obrazovnom okružju, može se pretpostaviti da bi bio motiviran za veću uključenost u interakciju i komunikaciju s drugim studentima. Ovaj je nalaz kompatibilan s istraživanjem Polančića i sur. (2010), Schmitz i sur. (2016), Saeed i sur. (2010) te Chuang i sur. (2012). Potvrđene su i hipoteze H2a i H2b koje promatraju odnos Individualni učinak → Kvaliteta informacija. Moglo bi se objasniti da će korisnici koji osjećaju pozitivan individualni učinak e-učenja u poslovnom i obrazovnom okružju vjerojatno vjerovati informacijama i vidjeti ih kao korisne i zabavne (Guimaraes i Igbaria, 1997; Jeyaraj, 2019; Sun i sur. 2014). Dokazana je treća skupina hipoteza (H3a i H3b) koje promatraju odnos Individualni učinak → Kvaliteta sustava. Korisnici e-učenja koji smatraju da njime ostvaruju individualne koristi visoko cijene kvalitetu sustava, ističući dobru organizaciju, dostupnost i jednostavnost korištenja. Sličan zaključak izvukli su Schmitz i sur. (2016). Suprotan smjer istoga odnosa analiziran je u istraživanju Cidrala i sur. (2018).

Utjecaj korisnosti e-učenja testiran je pomoću tri različita prediktora i dobiveni su sljedeći rezultati. Testiran je odnos Kvaliteta suradnje → Korisnost (H4a i H4b) te su obje hipoteze potvrđene. Polaznici koji ostvaruju dobru suradnju s ostalim polaznicima percipiraju visoku razinu korisnosti e-učenja u smislu dobre komunikacije i razmjene informacija te dostupnosti raznih vrsta programa i aplikacija. Takvi su nalazi također izvedeni iz istraživanja koje su proveli Cidral i sur. (2018). Slično, Anaya i Boticario (2009) zaključuju da nedostatak informacija unutar procesa suradnje u okružjima za e-učenje narušava kvalitetu procesa učenja. Kad je riječ o kvaliteti informacija, kao jednom od promatranih prediktora korisnosti e-učenja, dvije hipoteze pokazuju različite rezultate u pogledu svrhe korištenja e-učenja. Dok korisnici obrazovanja vide da kvaliteta informacija doprinosi korisnosti procesa e-učenja (H5b), u poslovnom kontekstu odnos između ta dva konstrukta nije potvrđen (H5a).

Iako mnoga istraživanja ukazuju na važnost kvalitete informacija za korisnost sustava za e-učenje (Mohammadi i Abrizah, 2015; Pow i Li, 2015; Zwain, 2019), nijedna od njih ne uzima u obzir razliku između poslovne i obrazovne upotrebe. Korisnici

e-učenja u poslovne svrhe ne obrađuju vanjske informacije u mjeri u kojoj to rade korisnici obrazovanja. Eksterne informacije koje se koriste u poslovnom kontekstu često su predmet proceduralnih pregleda i praćenja, dok se korisnici u obrazovnom području moraju osloniti na informacije koje bi mogle biti niže kvalitete. Naposljetku, šesta skupina hipoteza koja mjeri relaciju Kvaliteta sustava → Korisnost također pokazuje da postoji razlika u percepciji korisnika kada je riječ o ovom konstruktu u poslovnom i obrazovnom kontekstu. Za razliku od poslovne svrhe (H6a), hipoteza H6b koja promatra ovaj odnos u obrazovnoj svrsi nije podržana. Prema prethodnom pregledu literature, kvaliteta sustava uglavnom je pozitivno djelovala na percipiranu korisnost e-učenja u oba slučaja (Alsabawy i sur., 2016; Liaw i Huang, 2013; Rui-Hsin i Lin, 2018). Međutim, nedavno ova tvrdnja u obrazovnom kontekstu nije potvrđena (Salloum i sur., 2019) što je u skladu s dobivenim rezultatom ove studije. To se može objasniti činjenicom da je e-učenje u obrazovanju u Srbiji još uvijek u fazi razvoja i nije bilo učinkovito institucionalno organizirano sve do razdoblja COVID-19 kada je sve postalo *online*. Stoga kvalitetu sustava temeljenu na učinkovitoj tehničkoj podršci, poput jednostavnosti korištenja, dobre organizacije i brzoga pristupa, studenti ne doživljavaju kao dobar doprinos korisnosti e-učenja. S druge strane, poslovno orijentirani učenici prepoznali su kvalitetu sustava kao važan prediktor korisnosti. Organizacije koje koriste određene platforme za obuku zaposlenika imaju manji broj polaznika u usporedbi s obrazovnim institucijama, a kvalitetom sustava e-učenja lako se upravlja i tehnički podržava. Poslovne organizacije spremnije su ulagati u tehnološka rješenja za zaštitu podataka i pouzdanost sustava izbjegavajući tehničke prekide, umjesto da koriste lagane verzije otvorenoga koda s nižom razinom korisnosti.

Posljednji skup hipoteza (H7a i H7b) promatra relaciju Korisnost → Zadovoljstvo. U kontekstu poslovanja i obrazovanja, pretpostavljene su hipoteze podržane. Značajka korisnosti e-učenja koja utječe na zadovoljstvo korisnika tijekom korištenja sustava e-učenja odnosi se na dobru razmjenu informacija i dokumenata kao i mogućnost korištenja raznih vrsta programa i aplikacija. Do istoga zaključka došli su Al-Samarraie i sur. (2018) i Hammouri i Abu-Shanab (2018).

Zaključak

Iako današnje internetsko okružje omogućuje umrežavanje i trenutačno povezivanje velikoga broja zainteresiranih strana, kako iz akademske tako i iz poslovne zajednice, sve je važnije istražiti i objasniti individualni utjecaj svakoga sudionika. Ovo je značajno iz aspekta zadovoljenja individualnih potreba koje mogu dovesti do povećanja osobnoga zadovoljstva. Istraživanja na koja se oslanja ova studija ukazuju na važnost zadovoljstva korisnika kao preduvjeta za postizanje visoke kvalitete sustava učenja. Ovo istraživanje pridonosi dvostrukom promatranju očekivanja i stavova pripadnika obrazovne i poslovne sredine. To je dragocjeno za definiranje kvalitete sustava koji će dati odgovarajuće *plodove* u bližoj budućnosti.

Glavna je svrha rada utvrditi pokazatelje kvalitete kao utjecaja na zadovoljstvo korisnika e-učenja u poslovnom i obrazovnom kontekstu. Kako bi se omogućio dublji

uvid u razumijevanje kvalitete e-učenja za različite namjene, uspoređena su dva modela istraživanja kako bi se utvrdili čimbenici utjecaja na zadovoljstvo korisnika.

Prema rezultatima ovoga istraživanja bitne razlike mogu se uočiti samo u odnosima između kvalitete informacija i kvalitete sustava prema korisnosti e-učenja. Kvaliteta informacija nema pozitivan utjecaj na korisnost u poslovnom kontekstu, za razliku od obrazovnoga konteksta gdje se uočava jaka pozitivna povezanost ovoga odnosa. Druga razlika odnosi se na povezanost konstrukata kvaliteta sustava i korisnost, gdje primjena e-učenja u obrazovnom okružju ima negativan utjecaj.

Kako bi se premostio jaz u literaturi, u radu se mjere pokazatelji kvalitete e-učenja koji utječu na zadovoljstvo korisnika u obrazovnom i poslovnom okružju. Takav teorijski i empirijski doprinos dovodi do značajnih praktičnih implikacija zaključaka studije. Dublji pregled i razumijevanje čimbenika koji utječu na zadovoljstvo kupaca moglo bi pomoći menadžerima u oba okružja (poslovnom i obrazovnom) da prepoznaju u čemu su izazovi kvalitete e-učenja. To bi moglo omogućiti organizacijama da identificiraju prioritete za poboljšanje kvalitete i povećaju zadovoljstvo korisnika, a time i svoju konkurentnost.

Ograničenja ovoga istraživanja ogledaju se u veličini i homogenosti uzorka. Stoga se buduća istraživanja mogu proširiti na zemlje u regiji. Daljnjim istraživanjem mogla bi se obuhvatiti društva na različitim stupnjevima razvoja i postignućima u procesu digitalne transformacije.

Napomena

Istraživanje predstavljeno u ovom radu rađeno je uz potporu Ministarstva prosvjete, nauke i tehnološkog razvoja Republike Srbije, u okviru financiranja znanstvenoistraživačkoga rada na Sveučilištu u Beogradu, Tehničkom fakultetu u Boru, prema ugovoru pod matičnim brojem 451-03-47/2023-01/ 200131. Također, zahvaljujemo Fakultetu organizacijskih znanosti Sveučilišta u Beogradu na financijskoj potpori.