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ORIGINAL RESEARCH

Students' Satisfaction with E-learning Platforms in Bosnia and Herzegovina

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Abstract

This paper presents an empirical study of multidimensional relations in e-learning. The research is focused on students' satisfaction with the usage of e-learning. Data for this survey were collected on the territory of Bosnia and Herzegovina. By using random sample method, eleven higher education institutions in BIH were selected and the survey questionnaires were sent to their students. The collected data from students were analyzed and confirmed by applying confirmative factor analysis. The structural equations model was used to test the model. The obtained results have shown that Metacognitive strategies variable directly affects the students' satisfaction when using e-learning, while students' self-efficacy and goal setting variables indirectly affect the student's satisfaction, along with the environment structuring and social dimensions. The given results from this research will help other higher education institutions to improve their e-learning platforms in e-learning and by doing so students will continue to use these platforms. The conducted research has given guidelines for the development of this type of learning.

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1 Introduction

Students' usage of the Internet is widespread. The Internet offers students large pieces of information, as well as a quick download of them (Chiu et al. 2013). On the Internet, students are provided online learning platforms, where various tools are used to engage students in individual and group learning. Creating online courses enables universities to share their knowledge with students worldwide. The uniqueness of using the Internet as a learning medium has created the notion of e-learning. E-learning is a popular learning format because it is flexible and adaptable to students' needs (Cui et al. 2013; Richardson 2017). The main factors choosing e-learning were: ease of use, cost, flexibility, functionality and range of features (Khlaisang and Songkram 2019). The concept of e-learning is very important in higher education because it provides alternative ways to develop students' knowledge, skills and attitudes using modern technologies (Larbi-Siaw and Owusu-Agyeman 2016). E-learning has been growing rapidly in the field of higher education, because learning can be held anytime and anywhere and students gain greater control over their learning (Ke and Kwak 2013).

Over the past 2 decades, higher education institutions offer complete courses on the Internet as part of a syllabus, where credits for completing studies are given too (Cohen and Baruth 2017). E-learning presents students with the challenge of acquiring new knowledge so as to help them complete their studies with more ease. E-learning is an extension of classical learning into the virtual space (Callaghan 2018). Allen and Seaman (2016) found that e-learning, based on the obtained research results, is of crucial importance for higher education institutions in implementing long-term development strategies. If higher education institutions do not adapt new prevailing trends, they will become uncompetitive, which will lead to a reduction in student enrollment numbers and eventually the closure of those institutions. As a result, most higher education institutions support e-learning and they set online courses for e-learning platforms. However, there is a negative side about online courses, too. Students tend not to attend lectures anymore since they are able to acquire the same knowledge through these courses (Wilson and Cotgrave 2016). It is extremely important that online courses at first place provide learning support for full time students rather than just a basis for learning, in the same way as it is necessary to entice students to return into classrooms. The teacher was a facilitator, guide, mentor, and motivator (Ustunel and Tokel 2018) so it is necessary for students to return to the classroom in order to interact better with teachers.

The main aim of online courses in e-learning platforms is to actively involve a large number of students who participate independently in accordance with their learning goals, previous knowledge and skills (Cohen and Baruth 2017). However, not all students have the same knowledge, skills and competencies. Therefore, it is important to conduct a research how certain student skills affect the satisfaction of students in using online courses, i.e. e-learning. Likewise, students differ in the scope of knowledge they previously gained, then personalities and learning styles, which ensures better results to those students who use online courses as well as their successful completion of studies (Kauffman 2015). Also, e-learning platforms are not the same, they are different (Djouad and Mille 2018).

It is crucial for higher education establishments to deduce whether students are satisfied with their e-learning experience or not (Li et al. 2016). Higher education establishments

claim that students' satisfaction is one of the key elements in determining the quality of the syllabus in the market (Parahoo et al. 2016). Students' satisfaction is considered to be an important indicator of the quality of academic experience in learning at the higher education institution in question. That is the main reason why students' satisfaction with e-learning is in the focus of this study.

In order to examine the satisfaction of students with e-learning, a model has been created which focuses on computer and metacognitive abilities of students and setting learning objectives alike. Since e-learning is done in the web environment, social aspects of learning have been included, and these two variables will be regarded as dependents in this model. Based on the applied variables, student satisfaction will be examined in e-learning. The significance of this research is reflected in understanding the way in which students experience e-learning, and how satisfied they are with the use of e-learning which enables them to gain new pieces of information and complete their studies. Considering the results which are to be obtained from this research, higher education establishments in Bosnia and Herzegovina (B&H) and outside B&H, will become familiar with which students' capabilities and learning outcomes influence e-learning satisfaction of their students. In this way, higher education institutions will improve e-learning options in order to increase students' satisfaction.

In addition to the introduction in this paper, the theoretical framework of the research variables will be presented through a literature overview; research hypotheses will be formulated and tested in accordance with the set methodology for this research. Using the structural equations model (SEM), the model and research hypothesis will be evaluated in order to obtain results for this research. Next, more details of the research will be presented in the central part of the paper, where new results will be compared with obtained results from the previous research. In conclusion, the most important results of this research will be stated, as well as the perceived advantages and disadvantages of this research along with a few guidelines for future research.

2 Literature Review and Research Hypotheses

In this chapter, using the theoretical framework of the used variables and literature reviews, hypotheses of research will be formulated. First of all, the research variables will be theoretically presented, and then hypotheses of research will be defined through a review of previous research. Based on the research hypotheses, a model of research will be presented.

2.1 Computer Self-efficacy

Computer self-efficacy refers to assessing the ability of a person to use a computer in different situations, but this does not apply to simple skills such as copying or restoring a text (Hsia et al. 2014). Computer self-efficacy can be defined as an individual's belief in their own self-efficacy while completing a specific task by using computer applications (Saleem et al. 2011). In the context of e-learning, computer self-efficacy can be defined as students' ability to use certain online e-learning services in order to achieve the desired learning outcomes. Earlier researches have shown that people with a high level of computer self-efficacy achieve better results in e-learning (Chien 2012). Also, it has been proven that students with higher level of computer self-efficacy spend more time using e-learning technologies. More competent students are also more engaged in

the learning process (Sun and Rueda 2012) compared to those students who are less competent in computer self-efficacy, which has a direct effect on avoiding or omitting more challenging tasks. Therefore, it is vital to train students in using e-learning systems, since earlier studies have also proven that this way improves students' computer self-efficacy (Pellas and Kazanidis 2014) and their better results in e-learning. It should be noted that computer self-efficacy does not solely apply to studying about technology, but it also refers to a wider aspect of academic success, such as learning and achievement (Ale et al. 2017).

2.2 Metacognitive Strategies

When applying e-learning, it is necessary to understand the course material that is being taught, and to involve metacognitive strategies in the learning process. Metacognitive strategies play a central role in motivating students to understand that they themselves are the control mechanism of the learning process. Students need to understand that metacognitive strategy is a means of cognitive-emotional regulation (Tsai et al. 2018). Metacognition can be defined as a higher-order thinking, which implies an active strategy for inclusion of individual cognitive processes in learning (Kisac and Budak 2014). It encompasses the skills that enable students to effectively apply "learning to learn" and understand, control, manage and manipulate their cognitive knowledge and processes (Gaeta et al. 2013). Metacognitive strategies include setting learning objectives, planning tasks in the learning process, monitoring the understanding of learning and evaluating learning progress (Apaydin and Hossary 2017). By applying metacognitive strategies in e-learning, an individual attempts to understand what he/she reads and then makes progress with the acquired knowledge. Metacognition means inclusion in the declared knowledge which refers to adopting factual information in relation to "what", the procedural knowledge related to "how", and the conditional knowledge related to "when" and "why" (Negretti and Kuteeva 2011). Metacognitive strategies help students understand online course material and become more successful, as well as to achieve better results 1 day.

2.3 Goal-Setting

Setting goals is one of the most important factors in motivational psychology. The student must first set goals and activities to achieve the set goals (Van Horne et al. 2018), and then to achieve those goals. It helps students apply self-regulation in e-learning. It is important for four reasons. First of all, goals help students focus on relevant sources; secondly, students invest more effort into learning because goals are directed at it, thirdly, goals help students overcome learning difficulties, and finally, goals can help students change their behavior and achieve better results (Leigh Bruhn et al. 2017). On that basis, setting goals is often studied as a form of self-regulation, the success of which relies on an important mediation between student evaluation and different regulatory processes (DeMink-Carthew et al. 2017). When setting goals appears in the context of highlighting students' skills, and not in performance improvements, such an approach will give better results, and set learning goals will be achieved (Burnette et al. 2013). They relate to the assumption that specifically set goals increase the performance of students in relation to do-your-best goals (Nebel et al. 2017). Therefore, when setting goals, specific goals should be set that, to a lesser

extent, improve learning performance, and the ones which are easier to finish and are less ambiguous. These goals help to meet the stated objectives, which improves students' motivation to continue applying e-learning.

2.4 Environment Structuring

In order to achieve the defined goals of e-learning, it is necessary to implement them in an environment that will stimulate active learning (Bakir 2014). The specificity of e-learning is that it can be carried out at home or elsewhere with the active use of computers, so it is necessary to create a physical environment which will motivate students to use e-learning (Kirmizi 2014). The environment in which e-learning is applied needs to be appropriate, not to interfere with students' concentration so as not to distract them, to provide the best materials, and to make the physical place comfortable for learning (Martinez-Lopez et al. 2017). When applying e-learning, there are many chances that this learning will be interrupted due to visits to other web portals, social networks, etc. Because of this, Environment structuring describes the students' efforts to arrange their environment by completing set goals and tasks without making pauses or any other interruption while learning (Zhou et al. 2017). Based on this, it can be seen that Environment structuring can affect students' satisfaction or dissatisfaction, regardless of the goals set for learning, the possession of self-efficacy and metacognitive skills.

2.5 Social Dimension

The social dimension of e-learning refers to students' participating in social interactions, because socio-emotional factors influence learning (Lu and Churchill 2014). Participation in social interactions with other participants in the process of e-learning is essential for collaborative learning. By doing so, a student interacts with others, exchanges information and collaborates in common tasks that help him/her to master the desired material. Interaction is a basic component of not only traditional classrooms but also e-learning (Lin et al. 2017). The research conducted by Kuo et al. (2014) shows that students confirmed that social interaction matters while applying e-learning. In e-learning, there is no physical interaction among students or students and teachers alike. Therefore, it is very important to investigate this field and determine how social dimension affects students' satisfaction with e-learning.

2.6 Student Satisfaction

Students' satisfaction has roots in the experience that students had with a particular service in higher education (Puška and Ejubović 2016). When conducting e-learning, students' satisfaction will be linked to their experience in applying this kind of learning. Richardson (2017) sees the students' satisfaction with e-learning in the students' experience while using it. If the experience is positive, the student will be satisfied and vice versa. The satisfaction or dissatisfaction of the student with e-learning is a key decision whether he/she will continue to use this form of learning or not (Ke and Kwak 2013). If the student is satisfied with e-learning, he/she will continue to use this type of learning, and if not satisfied with it, the student will reduce the use of e-learning or, in the end; he/she will never use it anymore. Therefore, it is important to research students' satisfaction with e-learning.

2.7 Hypotheses and Model of Research

Success in e-learning is influenced by many factors. So that a student can be content with e-learning, he/she must possess certain computer skills, because he/she needs to have them if he/she wants to use online e-learning services. In addition, he/she must possess certain cognitive skills and understand online material. However, all this is insignificant if the student has failed to set the goals he/she wants to achieve by e-learning. If there are no goals set, then there is no focus on what needs to be achieved from e-learning. Therefore, in this study these variables as independent variables are taken into consideration: computer self-efficacy, metacognition strategies and goal-setting. As dependent variables, the following ones are taken: environment structuring, social dimension and student satisfaction.

Ejubović and Puška (2019) investigated the case of students in BiH that computer self-efficacy influences student satisfaction with online learning using multiple regression analysis. Odaci (2013) proved in a study that students who are more confident in their computer self-efficiancy choose more challenging long-term study goals, that helps them achieve better success in studying and are more satisfied. On the basis of this, a hypothesis of research is formulated:

H1 Computer self-efficacy has a significant positive impact on students' satisfaction when applying e-learning.

Students' satisfaction with e-learning is closely related to achieve results. In order to accomplish justified results, students need to understand an online way of learning. They find metacognitive strategies handy in this process. Johnson et al. (2009) showed in their study that metacognitive activities have an effect on the students' satisfaction with their course. In the dissertation Weaver (2012) proved that metacognitive strategies may enhance metacognitive awareness and students' satisfaction with using e-learning courses. Based on this, the following hypothesis is stated:

H2 Metacognitive strategies have a significant positive impact on students' satisfaction when applying e-learning.

In e-learning students are setting goals which they want to achieve. If these goals are met, students will be satisfied with e-learning. Accordingly, goals serve as a reference or standard for students' satisfaction (Baghurst et al. 2015). Students who achieve more challenging goals will achieve better learning outcomes, and hence they will be more satisfied. Therefore, setting goals is related to the satisfaction and performance of students (Rahyuda et al. 2014). On the basis of this, the following research hypothesis is formulated:

H3 Setting goals has a significant positive impact on students' satisfaction when applying e-learning.

Students with higher computer self-efficacy will have fewer impediments in applying e-learning because they can get the desired information more quickly and more easily. E-learning environment is more natural for students with more computer-based self-efficacy since they spend more time in e-learning, as it has been demonstrated in the Sun and Rueda study (2012). It is assumed that these students will also use other e-learning tools and they will easily come in contact with other participants. However, students do

not equally make use of social interactions with other students (Bognar et al. 2016), and it can be assumed that students with greater computer self-efficacy have better social interactions. Also, these students are able to work in e-learning systems well, and they deal with problems more easily by doing their best to overcome obstacles in e-learning (Hsia et al. 2014). The environment in which e-learning is studied is an obstacle to those students who have low computer self-efficacy, whereas for students with high computer self-efficacy—the environment does not have a negative impact on e-learning. Therefore, the following hypotheses are formulated in this study:

H4 Computer self-efficacy has a significant positive impact on Environment structuring in e-learning.

H5 Computer self-efficacy has a significant positive impact on Social dimension in e-learning.

The environment in which e-learning is conducted is designed in the way that it promotes the application of metacognitive strategies (Kistner et al. 2010). In e-learning environments, students are more actively involved in complex tasks that require the application of metacognitive strategies (Zohar and Dori 2012). Students who are involved in the process of e-learning learn at their own pace and on their own, and they are confronted with certain difficulties, so they must be more responsible in learning while applying metacognitive strategies (Karlen 2016). On the basis of this, the following hypothesis is formulated in this study which reads:

H6 Metacognitive strategies have a significant positive impact on Environment structuring in e-learning.

The transfer of metacognitive skills relies on applying social interactions among students, better to say, students and teachers. Students, by applying self-regulatory learning, where metacognition, motivation and effect are components of this learning, achieve their goals in social interaction (Efklides 2011), because interactions help students improve self-regulation skills. Therefore, e-learning platform should be embedded in the dialogues and student interactions with one another or with teachers alike (Shen and Liu 2011). On the basis of this, the following hypothesis is formulated in this study, which reads:

H7 Metacognitive strategies have a significant positive impact on social dimension in e-learning.

Previously conducted researches which were examining the relationship between environments, learning objectives and student motivational outcomes contributed to an understanding of the relation between setting goals and student achievements (Moeller et al. 2011). So as to start using e-learning, different levels of academic goals are set, depending on tasks, learning environment and learning beliefs (Xia 2017). Therefore, the set objectives of e-learning must be in line with the environment in which they are applied. On the basis of this, the following hypothesis of this research is formulated, which reads:

H8 Setting objectives has a significant positive impact on Environment structuring in e-learning.

In order to achieve the desired goals of e-learning more quickly, students interact and exchange experiences and knowledge about a specific issue as the part of e-learning. In some cases, while achieving goals, it is necessary to target small groups of students who focus on problem solving (Leigh Bruhn et al. 2017). In this way, students come to interact in order to achieve the stated goal of e-learning through joint problem solving. In achieving goals, the social interaction of students and the social interaction of both students and teachers alike are significant (Poortvliet and Darnon 2010). On the basis of this, the following hypothesis of this research is formulated, which reads:

H9 Setting goals has a significant positive impact on the Social dimensions of e-learning.

Efficient use of e-learning is significantly influenced by environment structuring. It is important to create a stimulating Environment structuring for e-learning to produce the desired results. A survey carried out by Zhou et al. (2017) has shown that environment structuring is a significant prerequisite for student satisfaction in using learning in social media. This was confirmed by Wu (2015) in his study, which proved that when students are less disturbed, they are more satisfied with e-learning as more interference leads to student dissatisfaction. On the basis of this, the following hypothesis of this research is formulated, which reads:

H10 Environmental structuring has a significant positive impact on students' satisfaction in e-learning.

The student is satisfied with the use of e-learning when he/she achieves learning goals using it. To achieve these goals, students come in interaction with one another. Lin et al. (2017) and Kuo et al. (2014) showed that there is no correlation between students' social interaction with their satisfaction in e-learning. However, the research of Borup et al. (2013) has shown that interaction between students has a positive impact on students' satisfaction. On the basis of this, the following hypothesis of this research is formulated, which reads:

H11 Social dimension has a significant positive impact on students' satisfaction in e-learning.

Based on the formulated hypotheses of this research, model of the research is being constructed which is presented in Fig. 1.

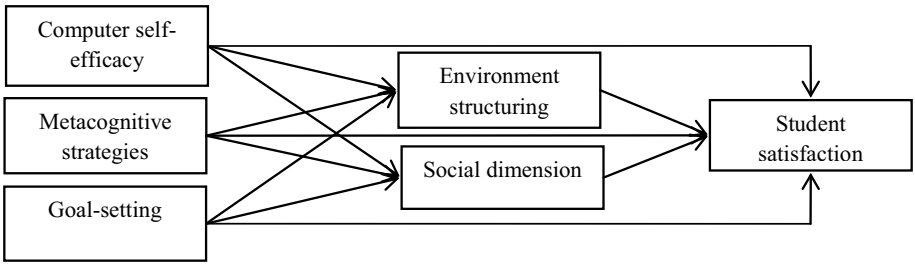

Fig. 1 Research model

3 Research Methodology

In this part of the paper, a sample of research and data collection procedure will firstly be presented, then an analysis of the uncoordinated bias, and, in the end, it will be explained how the variables of research have been measured.

3.1 Sample and Procedures

Research for the purpose of this study was conducted on the territory of BiH. The research included higher education institutions in B&H, which numbered 46 at the moment of data collection. Random sample consisted of 11 higher education institutions who we contacted in order to arrange the procedure of distribution of questionnaires. Most higher education institution chose to forward an electronic version of the questionnaire to their students; however two higher education institutions used a paper version of the questionnaire. The online questionnaire was accessed by 1632 students and was filled in by 312 students, which is a rate of 19.12%. It represents a good percentage in the online survey. While the paper version was filled in by 102 students, which added up 414 students involved in the questionnaire data on students' characteristics are shown in Table 1. Most of the surveys were completed by students from the University of Tuzla (137 students), followed by the University of Zenica (112 students), while the least were filled by students from the University of Bijeljina (27 students).

Table 1 Characteristics of students

Characteristics of students	Frequency	Percent
Gender of respondents		
1. Male	209	50.6
2. Female	204	49.4
Studying mode		
1. Full-time studies	356	86.0
2. Distance studies	58	14.0
Year of studies		
1. First	181	43.7
2. Second	77	18.6
3. Third	94	22.7
4. Fourth	47	11.4
5. Fifth or higher	15	3.6
Age		
1. Less than and 20	159	38.4
2. 21–23	171	41.3
3. 24–24	34	8.2
4. Over 27	50	12.1
Type of studies		
1. Social science	201	48.6
2. Natural science	20	4.8
3. Technical science	177	42.7
4. Other	16	3.9

A survey questionnaire was used for the application of this research. First, the papers related to e-learning and at the same time usage of the questionnaire, were collected. Then, the most commonly used e-learning variables were selected, and the papers that applied those variables were re-collected. Next, the questions which best described these variables were selected. After that, a questionnaire was made, which was sent to experts in the field of e-learning. Four experts altogether looked thoroughly at the questionnaire, and they provided suggestions for correction of the questionnaire. The revised questionnaire was sent to 10 students to fill in the questionnaire as well as to give necessary guidelines on how the questionnaire can be made simpler concerning the terms, meanings and questions, after which the final version of the questionnaire, i.e. the one used in this research was created.

3.2 Non-response Bias

In order to check non-response bias, statements from students who did not complete the questionnaire were taken. 21 students were identified as the ones who didn't respond. These students who did not participate in the survey reported that they didn't find that topic interesting, and that they did not have time to fill in this questionnaire as they were not interested in giving their opinion, etc. In this way, results of this research were confirmed, because there was not a single valid reason why this survey and questionnaire would not represent e-learning.

3.3 Measures

The used questionnaire consisted of two parts. The first part had to do with the characteristics of the respondents. The second part contained claims which represented used variables. The mentioned claims ranged from "I do not completely agree" to "I completely agree" for which a scale with five statements was used. This study was using six variables to create an e-learning model. These variables are as follows: computer self-efficacy, Metacognition strategies, goal-setting, environment structuring, social dimension and student satisfaction.

The variable named computer self-efficacy aims to examine how vast the students' knowledge of using computers is and how this knowledge affects usage of e-learning. In order to measure this variable, custom statement were used from the following studies: Hsia et al. (2014), Ratten (2013) and Hunga et al. (2010). The next variable, i.e. metacognition strategies aims to find out how students apply these strategies in understanding and adopting e-learning materials. In evaluating this variable, custom claims from the following studies have been used, such as: Kirmizi (2014) and Chiu et al. (2013). Goal-setting variable aims to show how students set goals for e-learning and how these goals direct students to acquire knowledge. The answers for this variable were measured based on the custom claims from the following studies: Martinez-Lopez et al. (2017), Kirmizi (2014) and Chiu et al. (2013). Environment structuring variable aims to investigate how students find an adequate environment for e-learning. To measure this variable, custom claims were used from the following studies: Martinez-Lopez et al. (2017), Waheed et al. (2016) and Chen (2014). Social dimension variable aims to examine how students enter into social interactions via e-learning and how these interactions influence this kind of learning. This variable was measured based on custom claims from the following studies: Cohen and Baruth (2017), Chen (2014) and Hunga et al. (2010). Student satisfaction variable examines how students experience e-learning and how satisfied they are with it. To measure this variable,

custom claims from the following studies have been used: Puška and Ejubović (2016), Larbi-Siaw and Owusu-Agyeman (2016) and Ratten (2013).

4 Results

So as to examine these formulated hypotheses and model of this research, confirmatory factor analysis (CFA) and structural equation model analysis (SEM) have been used. These analyses were made by using the programme Lisrel 8.8. Test reliability of the measurement scale was checked by Cronbach's Alpha (CA) indicator and interconnection among variables was tested using correlation analysis in the SPSS 20 program.

4.1 Scale Validity and Reliability

Before assessing SEM analysis, CFA needs to be done so as to test the reliability of data for the model. Using CFA analysis, unidimensionality of research variables is being tested. Results of CFA analysis have shown that all claims have a good factor basis because the value of this analysis for all claims is greater than 0.5. In order to examine the formulated model, it is necessary that CFA analysis indicators are higher than the recommended values. Values of these indicators should be higher than 0.9 for indicators (Hsia et al. 2014): comparative fit index (CFI), normed fit index (NFI) and non-normed fit index (NNFI) greater than 0.8 for indicators (Hsia et al. 2014; Lii and Kuo 2016): goodness of fit index (GFI) and Adjusted goodness of fit index (AGFI), less than 0.1 for the root-mean-square error of approximation indicator (RMSEA) and less than 3 for the indicator Chi square/degree of freedom (Hsia et al. 2014). The results obtained by the CFA analysis (Table 2) confirm that the value of the indicator is in accordance with the set values, which confirmed that the set model has acceptable unidimensionality and convergent validity.

The internal consistency of the variable' measurement scales was measured by using CA. CA values range from 0.75 to 0.92, which confirms that the obtained values are greater than the critical value of 0.7 (Puška et al. 2018). Using the obtained results, it is concluded that there is a reliable measuring scale, hence the variables are acceptable for the model. The composite reliability (CR) results range from 0.76 to 0.90 indicating that all latent values exceed the critical value of 0.7, which proves that all variables are reliable in this model. The value of Average variance extracted (AVE) is from 0.52 to 0.68 indicating acceptable discriminatory validity because these values are greater than the proposed critical value of 0.5. The smallest value of the square root of AVE is 0.719, which is greater than the absolute value of the correlations in the observed variables. In this way, the requirement of discriminatory validity of the structural model has been fulfilled.

Results of the conducted descriptive analysis (Table 3) have shown that students agree most with the claims related to the computer self-efficacy variable (Mean = 4.03), while they agreed least with the claims related to the variable goal-setting (Mean = 3.31). Based on this, it can be concluded that students give least attention to Setting goals variable in comparison to all the other used. As for differences in responses, it is measured by standard deviation (S.D.). Highest value of S.D. is found with the goal-setting variable (S.D. = 1.023) indicating that the students gave the most diverse answers for this variable, while the least diverse answers were with Metacognition strategies (S.D. = .841). Considering the correlation between the variables, it can be concluded that there is a very significant statistical relationship among all variables ($p < 0.01$). The most similar are the variables of

Table 2 Scale validity and descriptiveness

Scale	Item description	Loading	CR	CA
Computer self-efficacy	I am confident about my knowledge and skills to use e-learning platform	.67	.88	.88
	I can use the Internet efficiently so as to find the right information in e-learning	.77		
	I get information very quickly through e-learning	.75		
	I quickly discern good from bad information when e-learning	.66		
Metacognitive strategies	I use different e-materials to understand a particular term	.69	.77	.78
	I paraphrase and collect e-materials to enhance understanding	.67		
	When a particular e-material is difficult, I find a similar e-material in another form	.51		
Goal-setting	I clearly determine what my goal is before starting e-learning	.65	.80	.76
	Short-term and long-term goals of e-learning are made clear by me	.80		
	I do not interrupt e-learning until I fulfil my goal	.78		
Environment structuring	I apply e-learning in a comfortable environment	.78	.76	.75
	I know where I can apply e-learning most effectively	.80		
	I conduct e-learning in a place where I do not have a lot of interference	.78		
Social dimension	E-learning is an excellent platform for communicating with other users	.55	.88	.87
	Communication with other users in the online environment helps me with e-learning	.78		
	I feel comfortable while communicating with other users in e-learning	.74		
	Participating in online discussions helps me in e-learning	.72		
Student satisfaction	I like the idea of e-learning	.79	.90	.92
	E-learning is a pleasant experience	.80		
	I will continue to use e-learning in the future	.81		
	I am satisfied with the influence that e-learning has on my mastering the material	.78		

Chi square = 514.01, degrees of freedom = 174, chi square/degree of freedom = 2.954, GFI = 0.89, AGFI = 0.86, NFI = 0.96, NNFI = 0.97, CFI = 0.97, RMSR = 0.069, $p = 0.000$

Table 3 Composite reliability correlation and average variance extracted

Variable	Mean	S.D.	AVE	A	B	C	D	E	F
A. Computer self-efficacy	4.03	0.881	0.65	***.805***					
B. Metacognition strategies	3.86	0.841	0.53	.464*	***.728***				
C. Goal-setting	3.31	1.023	0.57	.380*	.365*	***.757***			
D. Environment structuring	3.62	1.007	0.52	.453*	.460*	.440*	***.719***		
E. Social dimension	3.59	0.885	0.64	.301*	.421*	.418*	.365*	***.799***	
F. Student satisfaction	3.91	0.915	0.68	.449*	.568*	.339*	.511*	.408*	***.825***

The square root of AVE is typed in bold italics along the diagonal

CR composite reliability, *AVE* average-variance-extracted

*Significance at 0.01 level

Metacognition strategies and Student satisfaction ($r = .568$), while the least related variables are computer self-efficacy and social dimension ($r = .301$). Based on all these conducted analyses, it can be concluded that the collected data in this study are adequate, which implies that they can be used to test the research model.

4.2 Structural Relationships

Table 4 shows the results of the SEM model. Based on the obtained values of the indicator model, it can be stated that this model is reliable, because all parameters are acceptable. Estimated values prove the formulated hypotheses in this study. Out of 11 formulated hypotheses in this study, 8 hypotheses have been accepted, while 3 of them are rejected. On the basis of the obtained responses in SEM analysis, H1 hypothesis was discarded (the variable computer self-efficacy has no significant positive effect on the variable or student satisfaction, path = 0.09, t = 1.52, $p > 0.05$), H3 (the variable goal-setting has no significant

Table 4 Model results

Hypothesis	Path estimates	*t* value	Sig	Results
H1. Computer self-efficacy → student satisfaction	.09	1.52	$p > 0.05$	Rejected
H2. Metacognition strategies → student satisfaction	.49	6.23	$p < 0.05$	Supported
H3. Goal-setting → student satisfaction	− .04	− 0.57	$p > 0.05$	Rejected
H4. Computer self-efficacy → environment structuring	.24	3.69	$p < 0.05$	Supported
H5. Computer self-efficacy → social dimension	− .01	− 0.17	$p > 0.05$	Rejected
H6. Metacognition strategies → environment structuring	.29	4.14	$p < 0.05$	Supported
H7. Metacognition strategies → social dimension	.31	4.34	$p < 0.05$	Supported
H8. Goal-setting → environment structuring	.30	4.64	$p < 0.05$	Supported
H9. Goal-setting → social dimension	.36	5.25	$p < 0.05$	Supported
H10. Environment structuring → student satisfaction	.27	3.94	$p < 0.05$	Supported
H11. Social dimension → student satisfaction	.12	2.26	$p < 0.05$	Supported

Chi square = 515.20, degrees of freedom = 175, chi square/degree of freedom = 2.944, GFI = 0.89, AGFI = 0.86, NFI = 0.96, NNFI = 0.97, CFI = 0.97, RMSR = 0.069, $p = 0.000$

positive effect on the variable student satisfaction, path = −0.04, t = −0.57, $p > 0.05$) and H5 (variable computer self-efficacy has important positive effects on the social dimension variable, path = −0.01, t = −0.17, $p > 0.05$). The results showed that the variable metacognition strategies has significant positive effects on variables of student satisfaction (path = 0.49, t = 6.23, $p < 0.05$), environment structuring (path = 0.29 and t = 4.14; $p < 0.05$) and social dimension (path = 0.31, t = 4.34, $p < 0.05$), which led to accepting H2, H6 and H7 hypotheses. The variable computer self-efficacy has a significant positive effect on the variable environment (path f = 0.24, t = 3.69, $p < 0.05$) by which H4 has been approved. The variable goal-setting has significant positive effects on environment structuring variables (path = 0.30, t = 4.64, $p < 0.05$) and social dimension (path = 0.36, t = 5.25, $p < 0.05$), which led to accepting H8 and H9 hypotheses. The variable student satisfaction has been positively influenced by the variables in environment structuring (path = 0.27, t = 3.94, $p < 0.05$) and social dimension (path = 0.12, t = 2.26, $p < 0.05$), which is the reason to accept formulated hypotheses H10 and H11.

5 Discussion

The conducted study provides a better understanding of the use of e-learning among students in BiH. It also provided a multidimensional model for understanding e-learning with emphasis on student satisfaction. Student satisfaction is the most important variable which reveals whether students will use e-learning in the future or not. Therefore, the focus of this paper was to investigate whether isolated variables such as self-efficacy, metacognition strategies and goal-setting directly influence students' satisfaction. Apart from these variables, the effect of dependent variables, i.e. environmental structuring and social dimension were also used to test students' satisfaction with them. Obtained results improve the understanding of the use of e-learning in BiH. They also provide significant implications both for the theory and for the practice of e-learning understanding.

This study has shown that different variables have a different impact on students' satisfaction. Computer self-efficacy variable does not have a significant effect on students' satisfaction, which confirmed the results by Jan (2015) and Li et al. (2017). Our results showed that computer self-efficacy to a great extent positively influences environment structuring, but not social dimension variable. Based on this, it can be concluded that the variable environment structuring plays the role of a full mediator. Such a great positive effect of computer self-efficacy variable is only visible when an active environment stimulating e-learning is applied, while social interactions do not affect the improvement of satisfaction with students who show better skills in applying e-learning. Being able to work skillfully on e-learning platforms will not directly affect the improvement of students' satisfaction. Just by adding the environment element while e-learning is applied, students' satisfaction is positively affected.

In metacognition strategies variable its positive effect has been shown on students' satisfaction, confirming the results by Johnson et al. (2009) and Weaver (2012). The positive significant effect of metacognition strategies has a bigger impact on students' satisfaction than it has on environment structuring and social dimension, but there is a significant positive effect on them too. Therefore, it can be concluded that environment structuring and social dimension variables play the role of a partial mediator in improving students' satisfaction. However, the variables of environment structuring and social dimension play the

role of a full mediator in determining the impact of the designer's set goals on students' satisfaction.

The results have showed that goal-setting variable has no significant positive effect on students' satisfaction. However, when goal-setting variable is applied in an environment that stimulates e-learning, such as interacting with other students or teachers alike, then it leads to students' e-learning satisfaction. There is a proof that the formulated goals improve the performance of students in e-learning (Nebel et al. 2017), but the results obtained from students in BiH have shown that goal setting has no significant direct positive effect on students' satisfaction. Also, the variable setting goals via environment structuring and social dimension variables indirectly influences the improvement of students' satisfaction.

The results of this study have shown that environment structuring and social dimension variables have positive significant effects on students' satisfaction, by which the results of the research carried out by Zhou et al. (2017), Wu (2015) and Borup et al. (2013) have been confirmed. In this way, it has been proven that these two variables play the role of a mediator in improving students' satisfaction with e-learning. Based on this, it can be concluded that if students want to be satisfied with e-learning platforms which are used by higher education institutions in BIH, they must use them in a pleasant environment that stimulates e-learning while interacting with other e-learning learners. Such a deduction is made since it has been proven that social interaction is an important component of e-learning, which confirms the findings from the study Lin et al. (2017).

The application of SEM in this e-learning model has shown that the best direct way to students' satisfaction is provided by the variable metacognition strategies, while setting goals is the best indirect way to students' satisfaction through the application of environment structuring which leads to the satisfaction of students. On the basis of obtained results, it can be concluded that the best way to influence students' satisfaction is a way of trying to understand e-materials and gaining new knowledge through e-learning. In doing so, the objectives of e-learning must be set, which will influence e-learning students' satisfaction in the stimulated active environment.

By applying the obtained results from this study, higher education institutions in BiH can actively exert students' satisfaction, thus opening new possibilities for further usage of e-learning by students. Firstly, higher education institutions must train students in using e-learning platforms, and used e-materials on these platforms must be of such a quality that they encourage the cognitive knowledge and skills in students. In doing so, e-learning platforms should encourage interaction with other participants as an e-learning platform environment is stimulating for them. Only by doing so, it is possible to influence students' satisfaction for the reason that if students are satisfied, e-learning platforms will be continued to be used.

6 Conslusion

Benefits of e-learning model used in this study matter because this model basically focuses on students' satisfaction, which is the most important factor in further e-learning. The way in which three variables computer self-efficacy, metacognition strategies and goal-setting influence the students' satisfaction directly or indirectly, with the help of Environment structuring and social dimension variables, has been researched. These results, obtained by using abovementioned model of research, have enhanced theoretical and practical implications for understanding e-learning, and provided the basis for a further research on how

the mentioned variables affect the improvement of students' satisfaction with e-learning platforms.

This study has shown that the used variables are well integrated in the applied model of research. SEM analysis of 11 formulated hypotheses has proved the relevance of 8 hypotheses, while 3 hypotheses were discarded. Obtained results have proved that only metacognition strategies variable directly affects students' satisfaction in comparison with other variables, while the other two variables, through the environmental structuring and social dimension, indirectly influence students' satisfaction with e-learning.

The disadvantages of the research are that some of the variables addressed in other papers are not covered. These variables are learning style, internet self-efficacy, students' gender, age, etc. However, in this study, a model was proven that was proven using the SEM method, so some variables were not covered by this model. In the future researches it is necessary to observe the effect of a bigger number of variables so as to get a more detailed picture. However, this would additionally burden the respondents since the questionnaire would be more elaborate and more attention would be needed to fill it in. Therefore, it is always necessary to balance the questionnaire and the variables used in the questionnaire. If we want to accept the used model and confirm these results, it is necessary to interview students from other countries. Qualitative data were used in this study while quantitative data were not taken into account. The main reason for doing so was a desire to maintain uniformity in data. In the future studies it will serve to an advantage to explore other aspects of e-learning, not just students' satisfaction, but also the way how other variables can influence our intention to continue using e-learning.

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