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Students' Satisfaction towards Online Learning: A Longitudinal Study

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ABSTRACT

Online education encompasses terms like web-based training, e-learning, distributed learning, Internet learning, web instruction, cyber education, virtual education, and net-based learning, as outlined by Urdan & Weggen (2000). It includes various technological applications and instructional methods such as computer-based learning, web education, virtual classrooms, and digital collaboration. Recognising that the educational landscape has transitioned from traditional in-person settings to online platforms, compelling tertiary education institutions to integrate technology effectively to ensure uninterrupted learning experiences is crucial. These institutions have thus become keen on optimising online course delivery, engaging students, and facilitating assessments. Understanding students' perceptions and responses to online education over time (longitudinally) offers valuable insights for these institutions, allowing them to adjust their approaches to meet students' needs and expectations. Considering students' views is essential, though adapting to online education poses challenges.
Consequently, this research investigates students' satisfaction with online education within higher education institutions. Employing a longitudinal approach for data collection, the study analysed the information through correlations and regression analysis. The sample comprised 104 undergraduate business school students from a private university. Findings indicated a positive correlation between all independent variables and student satisfaction, with course design, student interactions, and lecturer engagement significantly influencing satisfaction levels. The study highlights the potential of online education to contribute to the continuous development of innovative and effective learning within the complex knowledge management framework of higher education. However, the unpredictability of challenges and changes complicates the management and resourcing of higher education. Future studies should focus on the nature and quality of student interactions, their cognitive processes, preferences for specific educational tools and methods, motivation, and learning strategies to further understand factors influencing their satisfaction.

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1. Introduction

March 2020 marked a significant turning point globally due to the pandemic, affecting various sectors and altering daily life, social interactions, and business operations, as noted by Coulthard (2020). The COVID-19 pandemic led to widespread changes, including decreased industrial production and the shutdown of educational institutions worldwide. This situation forced higher education institutions (HEIs) to embrace Internet technologies to continue education through online learning. The transition from traditional classroom teaching to online methods posed challenges in preparedness for HEIs, requiring a focus on technology integration for effective e-learning without disrupting educational environments. As defined by Nguyen (2015), online learning employs the Internet for instructional delivery, material provision, and facilitating interactions among teachers and students.

Various platforms such as Zoom, WhatsApp, Skype, YouTube, and Google Classroom have enhanced the accessibility and distribution of educational content online. Despite the challenges and benefits associated with the shift to online learning during the pandemic, HEIs are still adjusting to this new educational paradigm, underscoring the importance of considering students' perspectives in the transition process. The utilisation of online learning, often referred to as e-learning, encompasses a variety of terms, including web-based training, distributed learning, and virtual learning, among others, as identified by Urdan and Weggen (2000). This educational approach integrates numerous technological tools and instructional methods, such as computer and web-based learning, virtual classrooms, and digital collaboration. It is essential to recognise the shift in education from traditional classroom settings to online platforms, necessitating higher education institutions (HEIs) to adopt technological solutions to ensure uninterrupted learning experiences.

HEIs are increasingly focused on optimising online course delivery, engaging students, and conducting evaluations effectively. Understanding students' long-term perceptions of online learning is crucial for HEIs to adapt and meet their needs and expectations. This study examines students' satisfaction with online learning in HEIs, using a longitudinal design for data collection and analysis through correlations and regression analysis. The research involved 104 undergraduate students from a business school in a private university, finding positive correlations between all independent variables and student satisfaction, particularly highlighting the significance of course design and student interactions with peers and lecturers. Despite the challenges, online learning presents opportunities for ongoing educational innovation and knowledge management within higher education. Future research should explore student interactions, thought processes, preferences, motivations, and learning strategies to enhance satisfaction.

1.1 Problem Statement

Online Web-based training, also known as e-learning, distributed learning, Internet-based learning, web-based instruction, cyberlearning, virtual learning, or net-based learning, encompasses a variety of distance education methodologies and technologies, as detailed by Urdan & Weggen (2000). This educational approach incorporates various technological applications and processes, such as computer-based learning, web-based learning, virtual classrooms, and digital collaboration. Online learning provides just-in-time access to course materials. It supports various electronic media for content delivery, including the Internet, intranets, extranets, satellite broadcasts, audio/video tapes, interactive television, and CD-ROMs. It aims to foster structured learning and encourage incidental learning and performance enhancement through self-directed learning. Campbell (2004) emphasises online higher education learning to enhance metacognitive, reflective, and collaborative learning capabilities. Unlike traditional learning environments, which are confined by location and real-time interaction under instructor control, online learning offers a flexible and dynamic platform for education. It supports asynchronous communication and real-time information access, making learning unbound by traditional constraints. Online learning environments are known for their active, student-centered pedagogical techniques and diverse pedagogical practices, as Baker (2003) and Browne (2005) noted. Research by Fortune, Spielman, and Pangelinan (2011) and findings by Yehia Mortagy and Seta Boghikian-Whitby (2010) indicate varying perceptions and satisfaction levels among students towards online versus face-to-face learning, with Tratnik (2017) highlighting significant differences in satisfaction. This study explores students' satisfaction with online learning in HEIs over time, aiming to adapt educational strategies to meet their needs and expectations.

1.2 Research Questions

i. What are the factors that determine student's satisfaction with online learning?
ii. What are the most influential factors contributing to the student's satisfaction with online learning?

1.3 Research Objectives

i. To investigate the relationship between the factors that determine student's satisfaction with online learning.
ii. To identify the most influence factors that contribute to the student's satisfaction with online learning.

2. Literature Review

2.1 Student Satisfaction

Student satisfaction is a temporary emotional state that emerges from assessing the educational experiences, services, and facilities encountered during the learning journey (Weerasinghe & Latitha, 2018). Teo and Wong (2013) highlight that assessing instructors, courses, and the overall educational program quality is crucial, with student satisfaction as a key metric. Investing significant resources, including money, time, and effort, into education is done to acquire the necessary knowledge and skills for employment (Becker, 1975). Students' satisfaction with their education, in terms of its quality relative to the resources spent, contributes to preserving an institution's stellar reputation, which is seen as a non-physical asset (Shea & Parayitam, 2019). Bolliger (2004) discovered that satisfaction positively impacts motivation and is commonly considered a dependent variable in online learning studies. This suggests that contented students in online learning environments will likely be more motivated and engage deeply with their course material.

Moreover, having control over the learning system and content enhances satisfaction with the educational experience. Successful interactions with the system and content fulfil students' thirst for knowledge and generate a feeling of accomplishment (Chou & Liu, 2005). Factors such as the instructors' role, students' motivation, course design, and interactions—both among students and with instructors—are pivotal in boosting student satisfaction.

2.2 Student Motivation

In online and traditional face-to-face learning environments, students' motivation is their eagerness to engage in and complete coursework to achieve success (Fieber, 2019). In their peer-reviewed study, Bitzer and Janson (2014) identified 31 student characteristics that significantly affect satisfaction and learning outcomes. These attributes include familiarity with Learning Management Systems (LMS), computer skills, self-efficacy, learning styles, motivation, metacognitive skills, and engagement in learning activities. This research explicitly targets motivational attributes, referred to in some studies as self-regulated learning, metacognition, or student learning engagement. Motivation is a psychological construct that initiates the self-regulation process in learning. It can be categorised into intrinsic and extrinsic types. Intrinsic motivation arises from an individual's internal desire to perform an activity for its inherent pleasure, enjoyment, or challenge rather than for some external reward.

Conversely, extrinsic motivation aims to achieve external rewards, such as accolades or recognition (Eom & Ashill, 2016). The link between motivation and engagement is significant; hence, a lecturer's ability to spark students' interest in course material can significantly increase their intrinsic motivation to pursue their studies further (Fieber, 2019). Lecturers' feedback is crucial for enhancing and motivating student performance by providing insights into their progress and guiding their learning efforts. Empirical research indicates that student engagement positively influences satisfaction with online learning, suggesting that more engaged students are likely to be more satisfied with their online educational experiences (Basuony et al., 2021; Kim & Kim, 2021).

We therefore hypothesise:

H1: Student motivation is significantly and positively related to students' satisfaction.

2.3 Course Design Structure

Moore (1991) defines course structure as how rigid or flexible the educational goals, teaching methods, and assessment techniques of a program are, emphasising its ability to adapt to or meet the individual needs of each learner. Course design encompasses the organisation and planning of the course, including its process, engagement, interactions, and how it is evaluated. Swan et al. (2012) discovered that the design and structure of a course significantly affect the learning process and outcomes, underlining the importance of students fully understanding the course structure and content to grasp expected learning outcomes. Shea and Parayitam (2019) stress that clarity in course structure is vital for setting clear student expectations. Kim and Kim (2021) argue that effective course design should consider learning objectives and provide explicit instructions for completing required assignments and activities. Rubin and Fernandes (2013) observed that online courses built around a community of inquiry are more conducive to deep learning. The relationship between course design and structure with student satisfaction and perceived learning outcomes is strong, especially when the course content is presented in a logical, comprehensible, engaging manner that kindles the learner's eagerness to learn (Kim & Kim, 2021; Eom & Ashill, 2016; Shea & Parayitam, 2019; Kuo et al., 2014). We therefore hypothesise:

H2: Course design and structure is significantly and positively related to students'satisfaction.

2.4 Lecturers

In education, lecturers are crucial pillars within institutions, significantly influencing student satisfaction, especially in online learning contexts. Their responsibilities include facilitating learning, tracking student progress, and offering constructive feedback on assignments, exams, or projects. Additionally, lecturers play

a crucial role in imparting knowledge, necessitating using the latest and most relevant resources for their courses. Before stepping into the classroom, this entails staying abreast of technological advancements and recent developments within their fields. Students expect their lecturers to demonstrate commitment, reliability, and a modern teaching approach to ensure their education investment yields worthwhile returns (Shea & Parayitam, 2019). This expectation extends to the online learning environment, where the student is at the learning process's core, and the lecturer acts more as a guide than a traditional instructor. Effective online teaching requires lecturers to provide explicit instructional materials, possess essential IT skills, and comprehend their role within the virtual classroom. A lecturer's performance, particularly regarding responsiveness and accessibility, is closely linked to student satisfaction (DeBourgh, 1999). Commitment from lecturers, especially in terms of availability for student inquiries and timely online class management, is crucial.

Swift feedback from lecturers is often perceived as more beneficial for the learning process than delayed responses (Kleij et al., 2012). Lecturers are not just facilitators but also motivators, tasked with monitoring and encouraging students, especially those who need to catch up. A passionate lecturer's dedication to student development and focus on enhancing their knowledge and learning experience can have a profound impact (Olson, 2003). Research has consistently shown a positive relationship between lecturers' roles and student satisfaction (Shea & Parayitam, 2019; Basuony et al., 2021). We therefore hypothesise:

H3: The role of the lecturers is significantly and positively related to students' satisfaction.

2.5 Interaction with Other Students

Learning extends beyond merely grasping and assimilating new information; it fundamentally entails integrating students into collaborative knowledge-sharing groups. Kuruchay and Inan (2017) assert that student communication and engagement are essential for constructing knowledge. Lucha and Berhanu (2015) define interaction as the exchange of thoughts, feelings, or ideas among two or more individuals, influencing each participant through feedback. Engaging with fellow students is crucial as it involves the communication process and the exchange of information among learners. Arbaugh et al. (2007) found that such interactions significantly enhance student learning outcomes and satisfaction. These meaningful exchanges foster intellectual development, spark intellectual curiosity, and encourage participation in constructive learning activities, thereby directly improving learning outcomes and satisfaction (Woo & Reeves, 2007). Interaction is identified as a critical factor in bridging the gap in online learning environments and promoting a positive learning experience (Boling et al., 2012). According to a qualitative analysis by Boling et al. (2012), online learning experiences that lack adequate student interaction feel less supportive, leading to isolation among students. Various studies have highlighted a significant link between student interactions and satisfaction across different contexts, including in China (She et al., 2021), Nigeria (Adewale & Tahir, 2022), and more broadly (Tawfik et al., 2018; Kuruchay & Inan, 2017; Nyathi & Sibanda, 2022). These findings elucidate that students who engage with their peers during the educational process report higher satisfaction levels than those who do not engage in such interactions. We therefore hypothesise:

H4: Interactions with other students is significantly and positively related to students'satisfaction.

2.6 Interaction with The Lecturer

"Interactions with the lecturer" encompasses communication between students and lecturers, enabling dialogue through synchronous and asynchronous channels, including text, audio, and video. This communication may manifest through various platforms such as emails, forums, and discussions, allowing lecturers to provide feedback on students' assignments and academic progress (Nyathi & Sibanda, 2022). Such interactions are fundamental teaching strategies, with the level of support provided by lecturers directly correlating to student satisfaction in online learning environments (Adewale & Tahir, 2022). Effective communication fosters a positive and productive relationship between lecturers and students, enhancing the learning experience. Lecturers must maintain consistent engagement and dialogue with students (Shin et al., 2003). Voluntary et al. (2000) have recommended that participation marks could be utilised to encourage student interaction. Lecturers serve as students' primary source of inspiration and knowledge, significantly influencing their learning process and facilitating peer interaction (Nyathi & Sibanda, 2022). A supportive lecturer is attentive to the needs and interests of students, providing motivation and a listening ear during online learning sessions, thus creating a respectful and inclusive environment where students feel valued and free to engage. Research has shown that the level of interaction between students and lecturers is critical in determining student satisfaction (Kuo et al., 2014; Nyathi & Sibanda, 2022; Adewale & Tahir, 2022). We therefore hypothesise:

H5: Interaction with the lecturer is significantly and positively related to students' satisfaction.

3. Methodology

3.1 Research Design

This study employed a longitudinal data collection approach, utilising correlation, and regression analyses to examine the data. This research currently aims to assess undergraduate students' perceptions of online learning. The sample consisted of 104 undergraduate students from a Business School at a private university.

3.2 Questionnaire Design

The survey items were based on a model by Eom & Ashill (2016). Participants provided demographic information and answered 28 questions across six dimensions relevant to this research: Student Motivation (SM; six questions), Lecturer Influence (LT; five questions), Peer Interaction (IS; four questions), Lecturer Interaction (IL; four questions), Course Design/Structure (CD; five questions), and Student Satisfaction (SS; four questions). Responses were captured on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree)—the questionnaire aimed to gather insights into students' views on e-learning implementation.

3.3 Data Collection Procedures

Emails for the 104 students were obtained from university records. A 32-item questionnaire was distributed via Google Forms, following instructions sent to the students' email addresses. Data analysis and significance testing were conducted using SPSS version 28. This dataset spans two years, covering four academic semesters: February Semester 2020/2021, September Semester 2021/2022 (Year 1), February Semester 2021/2022, and September Semester 2022/2023 (Year 2).

4. Results and Discussion

Table 1. Respondents' Demographic Characteristics

Demographic Variables	Definition	Frequency	Percentage
Gender	Female	75	72.1
	Male	29	27.9
Programme	Bachelor of Accountancy	35	33.7
	Bachelor of Business Administration	36	34.6
	Bachelor of Business in Marketing	23	22.1
	Bachelor of Technology Management	10	9.6
Duration spent on online learning in a week	Less than 15 hours	23	22.1

4.1 Descriptive

Descriptive statistical analysis was carried out to determine the characteristics of the study's participants. This examination focused solely on Part A of the dataset, which included demographic information such as gender, academic program, and weekly hours dedicated to online learning. According to the findings presented in Table 4.1, most of the participants are female, accounting for 72.1%, while males represent 27.9%. Regarding their academic programs, 33.7% are enrolled in the Bachelor of Accountancy, 34.6% in the Bachelor of Business Administration, 22.1% in the Bachelor of Business in Marketing, and 9.6% in the Bachelor of Technology Management. The data revealed that the predominant amount of time students engaged in online learning each week ranged between 15 to 30 hours.

Table 2. Result of Reliability Analysis

Variables	Number of Items	2020	2021
Student Motivation (SM)	6	0.655	0.735
Lecturer (L)	5	0.844	0.878
Interaction with Other Students (IWOS)	4	0.877	0.915
Interaction with The Lecturer (IWTL)	4	0.867	0.851
Course Design (CD)	5	0.887	0.919
Student Satisfaction (SS)	4	0.913	0.914

4.2 Reliability Analysis

Reliability analysis was conducted on each of the variables in Part B to determine whether they measure the same construct. In other words, to check for validity. Table 4.2 below shows the output of reliability analysis from SPSS. All the variables show a satisfactory alpha value. Thus, the questionnaire is valid and can be used for further analysis.

Table 3. Result of Reliability Analysis

Variables	2020	2021
Student Satisfaction (SS)		
Student Motivation (SM)	0.409	0.302
Course Design (CD)	0.500	0.640
Lecturer (L)	0.396	0.504
Interaction with Other Students (IWOS)	0.576	0.539
Interaction with the Lecturer (IWTL)	0.507	0.532

4.3 Pearson Correlation Analysis

Pearson correlations were used to describe the associations between Student Satisfaction and all independent variables (Table 4.3). The result shows that all independent variables moderately positively correlate with the dependent variable at a 0.01 significance value. Overall, the result indicates that SM, L, IWOS, IWTL, and CD have a positive linear relationship with SS. The influence of student satisfaction varied significantly by year. One of the essential effects is the correlation between lecturer and students' satisfaction.

Table 4. Result of Model Summary

Year	R	R Square	Adjusted R Square	Std. Error of The Estimate
2020	0.655	0.429	0.400	0.77834
2021	0.687	0.472	0.445	0.71687

4.4 Multiple Regression Analysis

Based on the model summary output shown in Table 4.4, The R square column represents the R^2 value, which is the percentage of variance in the dependent variable that can be explained by the independent variables. Thus, the result shows that R^2 equals to 0.429, and 0.472, respectively, for each year 2020 and 2021. For example, in 2020, 42.9% of the variability of student satisfaction was influenced by the independent variables. Other factors influence the remaining 57.1% of student satisfaction.

Table 5. Result of Coefficients

	Model	β	Std. Error	Beta	t	Sig.
2020	(Constant)	-0.823	0.679		-1.213	0.228
	Student Motivation	0.204	0.210	0.100	0.968	0.335
	Lecturers	0.507	0.117	0.421	4.320	0.000
	Interactions With Other Lecturers	0.176	0.156	0.113	1.1126	0.263
	Interaction With the Students	0.033	0.171	0.024	0.196	0.845
	Course Design	0.267	0.165	0.179	1.620	0.108
2021	(Constant)	0.223	0.583	-0.063	0.382	0.703
	Student Motivation	-0.111	0.159	0.400	-0.699	0.486
	Lecturers	0.526	0.169	0.148	3.121	0.001
	Interactions With Other Lecturers	0.217	0.173		1.251	0.214
	Interaction With the Students	0.295	0.095	0.290	3.097	0.843
	Course Design	0.011	0.165	0.008	0.065	0.948

The regression coefficient result shown in Table 4.5 indicates the impact of the independent variables on the dependent variable. For 2020, only Interaction with Other Students (IWOS) is significant, with β=0.507 showing a positive influence on Student Satisfaction (SS). For 2021, Interaction with Other Students (IWOS) and Course Design (CD) are significant, with β=0.295 and β=0.526, respectively, showing a positive influence on Student Satisfaction (SS).

5. Conclusion

A key discovery from this longitudinal experimental study highlighted a dynamic shift in online students' perceptions over the study, contrasting with the relatively stable or marginally changing perceptions among face-to-face learners. The regression analysis consistently corroborated these findings across various aspects. Additionally, lecturers play a pivotal role in university online education, upholding the majority of quality standards and categories to ensure educational quality and student satisfaction. This includes overseeing course technology, content, and learner support quality. Lecturers must undergo ongoing professional

development to enhance their abilities and knowledge, enabling them to excel as course designers, facilitators of discussions and technology, and motivators.

The online approach to higher education is nascent and understanding the challenges and expectations students and lecturers face is crucial for devising effective strategies to implement online learning. There are many advantages associated with online learning, including its potential to facilitate continuous innovation and development within the vast knowledge management frameworks of mass higher education. However, the obstacles and shifts encountered in this domain are complex and unpredictable, complicating the management and allocation of resources in higher education more than ever.

References

Adewale, S. and Tahir, M. B. (2022). *Virtual learning environment factors as predictors of students' learning satisfaction during the COVID-19 period in Nigeria*. Asian Association of Open Universities Journal 17(2), 120-133.

Arbough, J.B., & Rau, B.L. (2007). *A study of disciplinary, structural, and behavioural effects on course outcomes in online MBA courses.* Decision Science Journal of Innovative Education, 5(1), 65–94.

Basuony, M. A-K., EmadEldeen, R., Farghaly, M., El-Bassiouny, N. and Mohamed, E. K. A. (2021). *The factors affecting student satisfaction with online education during the COVID-19 pandemic: an empirical study on an emerging Muslim country.* Journal of Islamic Marketing 12(3), 631–648.

Becker, G. S. (1975). *Human capital: A theoretical and empirical analysis, with special reference to education,* 2nd ed, Columbia University Press for NBER, New York, NY.

Bitzer, P., & Janson, A. (2014, July). *Towards a Holistic Understanding of Technology-Mediated Learning Services–A State-of-the-Art Analysis.* In Bitzer, P. & Janson, A. (2014): Towards a Holistic Understanding of Technology-Mediated Learning Services-A State-of-the-Art Analysis. In: European Conference on Information Systems (ECIS), Tel Aviv, Israel.

Boling, E.C., Hough, M., Krinsky, H., Saleem, H., & Stevens, M. (2012). *Cutting the distance in distance education: Perspectives on what promotes positive, online learning experiences.* Internet and Higher Education, 15,118-126

Bolliger, D. U. (2004). *Key factors for determining student satisfaction in online courses*. International Journal on E-learning,3(1), 61-67.

Chou, S. W., & Liu, C. H. (2005). *Learning effectiveness in a Web-based virtual learning environment: a learner control perspective.* Journal of computer-assisted learning,21(1), 65–76.

DeBourgh, G.A. (1999). *Technology is the tool; teaching is the task: Student satisfaction in distance learning.*

Eom, S. B., & Ashill, N. (2016). *The determinants of students' perceived learning outcomes and satisfaction in university online education: An update*. Decision Sciences Journal of Innovative Education, 14(2), 185–215.

Fieber, C. (2019). *The effect of collaboration on online student motivation in a College Biology Course*, University of South Carolina, Sumter.

Finaly-Neumann, E. (1994). Coursework *characteristics and students' satisfaction with instructions.* Journal of Instructional Psychology, 21(2), 14-19

Kim, S., and Kim, D. –J (2021). *Structural relationship of key factors for student satisfaction and achievement in asynchronous online learning*. Sustainability 13, 6734.

Kleij, F.M.v.d., Eggen, T.J.H.M., Timmers, C.F., & Veldkamp, B.P. (2012*). Effects of feedback in a computer-based assessment for learning.* Computers & Education, 58,263-272.

Kuo,Y.-C., Walker, A.E., Schroder, K.E.E., & Belland, B.R. (2014). *Interaction, internet self-efficacy, and self-regulated learning as predictors of student satisfaction in online education courses*. Internet and Higher Education, 20, 35-50.

Lucha & Berhanu. (2015). *Analysis of Verbal Interaction between Teacher and Students in Industrial Engineering International Program at the Islamic University of Indonesia.*

Moore, M. G. (1991). *Distance education theory*. In D. Keegan (Ed.), Theoretical principles of distance education. New York, NY: Routledge, pp. 22–38.

Nyathi, M. and Sibanda, E. (2022). *E-learning: substitutability of learner-learner, and learner- facilitator interactions to enhance learner satisfaction in higher education*. Journal of Research in Innovative Teaching & Learning, 2397-7604.

Olson, D. L. (2003). *Principles, impracticality, and passion*. Phi Delta Kappa, 85(4), 307–309.

Rubin, B., & Fernandes, R. (2013). *Measuring the Community in Online Classes*. Journal of Asynchronous Learning Networks, 17(3), 115-136.

She, L., Ma, L., Jan A, Sharif Nia H. and Rahmatpour, P. (2021). *Online learning satisfaction during COVID-19 pandemic among Chinese university students: the serial mediation model.* Front. Psychol 12, 1-12.

Shea. T., & Parayitam. S. (2019). *Antecedents of graduate student satisfaction through e-portfolio: content analysis.* Education + Training, 61(9), 1045-1063
Shin, N., Jonassen, D., & McGee, S. (2003). *Predictors of well-structured and ill-structured problem-solving in an astronomy simulation*. Journal of Research in Science Teaching, 40,6-33.
Sun, P. C., Tsai, R. J., Finger, G., Chen, Y. Y., & Yeh, D. (2008). *What drives a successful e-learning? An empirical investigation of the critical factors influencing learner satisfaction.* Computers & education,50(4), 1183-1202.
Swan, K., Day, S. L., Bogle, L. R., & Matthews, D. B. (2014). *A collaborative, design-based approach to improving an online program.* The Internet and Higher Education, 21, 74–81.
Teo, T., & Wong, S. L. (2013). Modelling *key drivers of e-learning satisfaction among student teachers*. Journal of educational computing research,48(1), 71-95.
Volery, T., & Lord, D. (2000). *Critical success factors in online education*. International Journal of Educational Management, 14(5), 216–223.
Weerasinghe, I. M. S., & Lalitha, F. R. S. (2018). *University facilities and student satisfaction in Sri Lanka.* International Journal of Educational Management, 32(5), 866–880.
Woo, Y., & Reeves, T.C. (2007). *Meaningful interaction in web-based learning: A social constructivist interpretation.* Internet and Higher Education, 10,15-25.

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