

Motivation and satisfaction in online learning during COVID-19 pandemic: A systematic review

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ABSTRACT

The study summarized current studies on student motivation and satisfaction and identify research gaps for proposing studies for the next study. A total of 50 academic research papers on satisfaction and motivation during COVID-19 pandemic learning were published during pandemic era December 2019 to December 2020. There were 45,935 participants on the study with 357 elementary students, 478 middle-high students, 42,151 college students and 2,949 teachers. An important result of this study is a significant change in motivation and satisfaction. From the review, this paper updates a new database, with a wide range of student satisfaction and motivation through online learning during the COVID-19 pandemic, especially to improve student satisfaction and motivation for a successful learning process. Suggests that it can be considered an effective learning method. This study is beneficial for education experts, lecturers, teachers, trainers, and technologists who are interested in assessment, learning, guidance, design, and online-based learning environments during a pandemic or after a pandemic to increase motivation and satisfaction in learning.

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1. INTRODUCTION

The COVID-19 pandemic has become a major challenge for education systems around the world [1]. This pandemic has spread everywhere and made everyone needs to maintain social distancing [2]. Health measures in education and training plans need to be strengthened to prevent the spread of COVID-19 and to continue learning while providing students with the opportunity to continue learning. [3]. Education after the pandemic ends has two choices, return to traditional education or transform into other forms [4]. Now, one of the famous forms of education method is online learning during pandemic.

Online learning is learning that takes place over the internet [5]. Online learning provides enormous benefits and is the best in all sectors, especially in education [6]. It has made education easy and convenient for everyone to access [7]. It can provide convenience in terms of pedagogy, flexibility, affordability, accessibility, and lower costs during the COVID-19 pandemic [8]. However, online learning has limited face-to-face interactions in class [9]. This has the potential to affect motivation and learning satisfaction.

Motivation is one of the important variables to achieve optimal learning outcomes [10]. Comprehensive technology-based online learning during the COVID-19 pandemic can have a direct and indirect impact on student motivation [11]. In both Italy and Portugal, students' motivation to study online

diminished during the COVID-19 pandemic [12]. Meanwhile, students are more motivated to learn, with 74% of respondents saying that online learning in Indonesia is more effective than traditional learning [13]. The difference in these findings becomes necessary to investigate how many studies have found that online learning can increase or decrease motivation.

Student motivation influences many variables in learning, one of which is the level of satisfaction. In COVID-19 pandemic, student motivation to take online classes is an important determinant of student satisfaction [14]. However, as established in Bulgaria, student satisfaction with online learning declined during the pandemic. [15]. Indeed the availability of platforms can be the biggest influence on learning satisfaction [16]. In this study several researches on motivation and satisfaction level during pandemic COVID-19 will be reviewed and analyzed. Through this systematic review, the purpose of study will be more focused to find out how is the students and teachers' motivation and satisfaction level, investigate the geographic scale, analyzing the research instrument and method used in research.

The novelty in this analysis allows the finding that if the pandemic continues and online learning becomes the main choice, there will be distortions and changes in habits that affect motivation and levels of satisfaction in the learning process. Educators and students who are getting used to online will continue to want online-based learning because they already feel satisfaction in learning and increase the ease and motivation in learning. The specific purpose of this study was to integrate the best available evidence of changes in online learning conditions and motivation and satisfaction during the COVID-19 pandemic. There were three potential research: i) Examine the impact of online learning during a pandemic on motivation and satisfaction levels; ii) Development of a configuration framework to generate appropriate strategies to increase motivation and satisfaction levels; and iii) Utilize online learning during the pandemic to study and investigate motivation and satisfaction level. The main contribution of this study is to provide motivational and satisfying ideas for online learning during the COVID-19 pandemic. This will allow monitoring and development of appropriate and efficient learning strategies

2. RESEARCH METHOD

Systematic review is the activity of statistical meta-analysis of results and evaluations of the quality of studies that have been conducted by other researchers [17]. The systematic review method has several purposes: confirm the implementation of current practices based on relevant evidence, determine the quality of the research evidence, and address any practical uncertainties or differences that may arise [18]. However, as a guide for future research, the general purpose of systematic reviews is to assess the quality of key research [19]. The results of the assessment can be in the form of distributing literature based on time, place, theory, concept and type of method used, and the types of results obtained [20]. The systematic evaluation on this examines objectives to give the modern-day repute of the literature on students' motivation and pride in on line gaining knowledge of throughout the COVID-19 pandemic.

To carry out a systematic review one must follow the guidelines well. Some important reasons for researchers should follow the guidelines are: i) Allow systematic reviewers to carefully anticipate potential problems; ii) Allow reviewers to compare protocols to complete the audit (that is, identify selective reports), duplicate the audit method, and evaluate the effectiveness of the planned method; iii) Prevent arbitrary decisions regarding inclusion and data extraction criteria; iv) Reduce duplication and improve collaboration [21]. In this study, the process of systematic review was done by following the stage [22], there are two step of systematic review: article identification and analysis procedure. In this study, the systematic review procedure is shown in Figure 1 [23].

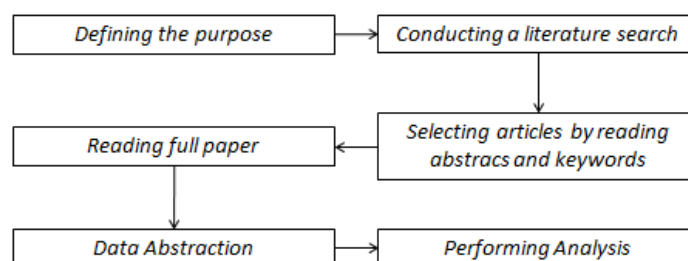


Figure 1. The procedure of systematic review

2.1. Article identification

Research articles published in English journals about motivation and satisfaction were obtained by electronic databases such as Google Scholar, Scopus, Taylor and Francis Online Science Direct, and Sage Publication during the pandemic period between December, 2019 to December, 2020. The keywords used for the search were "motivation in pandemic," and "satisfaction in pandemic," as well as a combination of the following terms; "enthusiasm for learning," "desire to learn," "intention to learn," "interest," and "engagement." However, academic papers related to words such as "motivation other than education" (in economics, motivation in social relations) and "satisfaction other than education" (satisfaction with the services of economic, health, or social institutions) were excluded. Articles analyzed in each database were peer reviewed and published in academic journals with English language. The reference list for this article is also used to find additional motivational and satisfaction articles, as the first article that appears in various databases is frequently cited and recently published.

For each article examining the motivation and satisfaction of online learning during a pandemic, the following information was collected in the database: journal name, year of publication, author, affiliation, country where the survey was conducted, method (data collection method, data type, sample), theory used, and survey results. The data collection method in each article is classified in several ways such as observation, interviews, tests, and surveys. The types of data used are classified based on quantitative, qualitative or mixed methods. Finally, the overall results categorized by the survey questions are presented to understand how pandemic motivation and satisfaction are studied and linked to online learning.

2.2. Analysis procedure

This study determined student motivation and satisfaction with COVID-19 pandemic online learning and to support further research. Therefore, this study presents several aspects. That is, the type and author of the study (location, year of publication, journal), the method used, the theory of learning motivation and satisfaction, and the results of the study. The survey results are then categorized based on the survey questions. Finally, we explained why this review is important for further research and how student motivation and satisfaction research can be transformed into or contribute to online learning.

3. RESULTS AND DICUSSION

A total of 50 scientific research papers on the satisfaction and motivation of COVID-19 pandemic learning were published during December, 2019 to December, 2020 pandemic era as presented in Table 1. Research papers identify more specific knowledge about each paper to find out which research was mentioned. A total 45,935 participants on the study were consisted of 357 elementary students, 478 middle-high students, 42,151 college students, and 2,949 teachers.

The goal of a systematic review is to determine what, where, by whom, how, when, and what was discovered. Through this technique, authors can determine the value of various studies and areas such as motivation and satisfaction in COVID-19 epidemic learning. It may helpful to plan for future research. Some important revelations emerged from the review: i) The research focuses on Indonesia, the United States and China; ii) Research interests investigated motivation and satisfaction in the fields of general education, science and technology, and health/medicine; iii) Qualitative methods were mainly used rather than quantitative or mixed methods; iv) COVID-19 objective study focusing on the impact of online/distance learning on learning motivation and satisfaction during a pandemic.

Table 1. Scientific research papers on the satisfaction and motivation of COVID-19 pandemic

No	Author (year, no of authors)	Participant	Study location
1	[6]/4 all	175 college students	India
2	[7]/1	70 teachers, 407 college students	India
3	[13]/3 (2 Indo, 1 Malay)	120 senior high school students	Indonesia
4	[14]/1	100 college students	South Korea and India
5	[16]/6 (5 China, 1 US)	Middle and high school students, junior college students, undergraduate students, graduate students	China
6	[24]/2 (All Indonesia)	10 college students	Indonesia
7	[25]/3 (all Indonesia)	50 senior high school students, 20 teachers	Indonesia
8	[26]/1 (Russia)	168 college students	Russia
9	[27]/4 (All Netherlands)	200 teachers	Netherland
10	[28]/6 (All Denmark)	486 college students	Denmark
11	[29]/1	58 college students	South Korea
12	[30]/6 (All Malaysia)	39 college students	Malaysia
13	[31]/4 All	102 teachers, 416 college students	Sri Lanka
14	[32]/4 all	115 college students	Indonesia

Table 1. Scientific research papers on the satisfaction and motivation of COVID-19 pandemic (*continued*)

No	Author (year, no of authors)	Participant	Study location
15	[33]/3 All	60 high school students	Indonesia
16	[34]/5 all	335 college students	Ghana
17	[35]/5 All	415 college students	United States
18	[36]/7 (all)	301 college students	Indonesia
19	[37]/6 (All Australia)	248 junior high school students	Australia
20	[38]/5 (4 China, 1 Taiwan)	357 elementary students	China
21	[39]/2 (All Indonesia)	53 teachers	Indonesia
22	[40]/4 (All Singapore)	179 college students	Singapore
23	[41]/3 (All Portugal)	1479 teachers	Portugal
24	[42]/5 All	980 teachers	Rumania
25	[43]/2 all	768 college students	Ghana
26	[44]/6 all	206 college students	Mexico
27	[45]/1	270 college students	United States
28	[46]/4 all	467 college students	Ghana
29	[47]/8 all	No mentioned	United States
30	[48]/2 all	30 College students	Indonesia
31	[49]/5 Slovenia	31,212 college students	Many countries
32	[50]/8 (2 Brunei, 2 Pakistan, 2 Saudi Arabia, 1 Australia, 1 China)	320 college students	Pakistan and Brunei
33	[51]/1	162 undergraduate medical students	Saudi Arabia
34	[52]/8 (all)	652 college students	Jordan
35	[53]/3 all	914 college students	Poland
36	[54]/1	988 college students	United States
37	[55]/8 all	60 college students	Saudi Arabia
38	[56]/2 all	186 college students	Vietnam
39	[57]/3 all	66 college students	Indonesia
40	[58]/2 all	45 teachers	Indonesia
41	[59]/6 (2 Malay, 4 Pakistan)	408 college students	Pakistan
42	[60]/3 all	256 college students	Indonesia
43	[61]/8 all	100 college students	Indonesia
44	[62]/2 all	200 college students	Rumania
45	[63]/5 (4 Malay, 1 Pakistan)	280 college students	Malaysia
46	[64]/10 All	340 college students	Brazil
47	[65]/3 all	399 college students	Malaysia
48	[66]/1	330 college students	China
49	[67]/1	83 college students	Oman
50	[68]/1	250 College students	Indonesia

3.1. Geographic scope

The studies were conducted in 24 countries. Most of the papers were from Indonesia (25.49%), United States (7.84%), China (5.88%), Ghana (5.88%), India (5.88%), Malaysia (5.88%) as presented in Table 2. A relatively small number (3.92%) of research papers came from Pakistan, Romania, Saudi Arabia and South Korea. Only one research paper (1.96%) from Australia, Brazil, Brunei, Denmark, Jordan, Mexico, Netherlands, Oman, Poland, Portugal, Russia, Singapore, Sri Lanka and Vietnam. In total, there are 187 authors from 24 countries, and 22.46% of authors from Indonesia studied learning motivation and satisfaction during the COVID-19 pandemic. As shown in Table 2, other publications of publications at publications were 8.56% from the United States, Malaysia, China, Ghana, and 5.35% from Brazil.

This study showed that 50 research papers on learning motivation and satisfaction were published in 24 countries during the COVID-19 pandemic. Most of the places are dominated by Indonesia, the United States and China. There are several research papers from other countries such as Ghana, India, Malaysia, Pakistan, Romania, Saudi Arabia, South Korea, but the number of papers reviewed may not be so important. There are several reasons why it seems that among the three major countries of Indonesia, the United States and China, they have published a particularly large amount of research on this topic compared to other countries. Indonesia recently had a serious impact on the education sector with the COVID-19 pandemic [24]. In addition, in this country there is an increase in the consumption of digital content so that research is often conducted on the motivation and satisfaction of digital content in learning [25]. In China, there has been a sharp increase in anxiety due to the COVID-19 pandemic [69], which has the potential to affect motivation and satisfaction in the learning process.

Table 2. Study location and author (based on author affiliation) examining motivation and satisfaction in learning during COVID-19

Country	Study location		Authors	
	N	%	N	%
Indonesia	13	25.49	42	22.46
United States	4	7.84	16	8.56
China	3	5.88	10	5.35
Ghana	3	5.88	10	5.35
India	3	5.88	5	2.67
Malaysia	3	5.88	16	8.56
Pakistan	2	3.92	7	3.74
Rumania	2	3.92	7	3.74
Saudi Arabia	2	3.92	11	5.88
South Korea	2	3.92	2	1.07
Australia	1	1.96	7	3.74
Brazil	1	1.96	10	5.35
Brunei	1	1.96	2	1.07
Denmark	1	1.96	6	3.21
Jordan	1	1.96	8	4.28
Mexico	1	1.96	6	3.21
Netherland	1	1.96	4	2.14
Oman	1	1.96	1	0.53
Poland	1	1.96	3	1.60
Portugal	1	1.96	3	1.60
Russia	1	1.96	1	0.53
Singapore	1	1.96	4	2.14
Sri Lanka	1	1.96	4	2.14
Vietnam	1	1.96	2	1.07
Total	51*	100	187	100

*One paper examined the motivation and satisfaction in two different countries

3.2. Scope by field and research method

Numerous studies that motivate and explain learning during the COVID-19 pandemic have been conducted in 43 different journals and conferences in various disciplines as seen in Table 3. The areas frequently examined in the COVID-19 pandemic Learning Motivation and Satisfaction Research Journal are General Education (28%), Health and Medicine (22%), Science and Technology (20%), Psychology (4%) and other journals (26%) missing specific field next to name. The dominance of journal studied about motivation and satisfaction in learning during pandemic COVID-19 has been found as BMC Medical Education (8%) and Sustainability Journal (6%).

Various methods have been used to measure motivation and satisfaction with learning during pandemic as seen in Table 4. Most researchers performed qualitative designs (24%) rather than quantitative designs (22%). There were five of the 50 published articles (10%) used a mixed method design. The most common methods used were surveys (47.17%) and surveys (41.51), including on-site, online, and postal emails. Other methods were interviews (5.66%), pilot tests (3.77%), and document reviews (1.89%). There were five subjects selected about motivation and satisfaction learning during pandemic COVID-19 from 50 article published. The most frequently researched were about general in education (64%) but 11 (22%) articles discuss about motivation and satisfaction in health/medical subject. Only three article each about science and English subject (6%) and only one article (2%) about information and communication technology (ICT) learning subject.

The research method is a step or form of activity that aims to collect information or data and conduct investigations on that data. To conduct a study, researchers need to determine several factors: data type, sample, event type, scope, purpose, and research area. In this survey, the most commonly used methods are surveys and surveys, with more than 60% of the surveys reviewed. The main advantages of the survey method include that they are broad and are cheaper to conduct [70]. In this systematic review, several researchers conducted a lot of data collection online either using e-forms or sent via email depending on the demographics of the participants and the type of study.

Table 3. Field and journal distribution of research paper about motivation and satisfaction in learning during COVID-19 pandemic

Field	Title	No. of papers	Field total				
			N	%			
Science & Technology	Journal of Science Education and Technology	1	10	20			
	European Journal of Research and Reflection in Educational Sciences	1					
	International Research Journal on Advanced Science Hub	1					
	Journal of Social Sciences and Humanities	1					
	International Journal of Science, Technology & Management	1					
	International Journal of Advanced Science and Technology	1					
	Journal of Educational Technology and Online Learning	1					
	International Journal of Advanced Trends in Computer Science and Engineering	1					
	Online Journal of Communication and Media Technologies	1					
Health and Medical	Ingenierie des Systemes d'Information	1	11	22			
	Medical Education Journal	1					
	International journal of environmental research and public health	1					
	International Journal of Environmental Research and Public Health Healthcare	1					
	BMC Medical Education	4					
	BMJ journal Open	1					
	Journal of Professional Nursing	1					
Psychology	Systematic Reviews in Pharmacy	1	2	4			
	Psychology Research and Behavior Management	1					
	The International Journal of Indian Psychology	1					
General Education	European Journal of Teacher Education	1	14	28			
	IJERI: International Journal of Educational Research and Innovation	1					
	Asian Journal of Education and Social Studies	1					
	Journal of Elementary School Education	1					
	Journal of Innovation in Educational and Cultural Research	1					
	European Journal of Education Studies	1					
	International Journal of Educational Research Open	1					
	Journal of Education: Theory, Research, and Development	1					
	Journal of Education and e-Learning Research	1					
	Social Work Education	1					
	Journal of Iqra': Study of Educational Sciences	1					
	Asian Education and Development Studies	1					
	Asian Journal of University Education	1					
	Journal of Education for Teaching	1					
	Others	Journal of Physics Conference/IOP			1	13	26
		Journal of youth and adolescence			1		
Journal of Southwest Jiatong University		1					
Sustainability		3					
Ecology and Evolution		1					
Children and youth services review		1					
Ubiquity		1					
International Journal of Control and Automation		1					
Quality and Quantity		1					
medRxiv		1					
Loquen: English Studies Journal		1					

Table 4. Research method used in articles on learning motivation and satisfaction during pandemic

	Category	N	%
Detail of the methods	Online survey	18	41.51
	Survey by postal email	4	
	Online questionnaire	16	47.17
	onsite questionnaire	4	
	Questioner by postal mail	4	
	Questioner but not specified	1	
	Document review	1	1.89
	Onsite Interview	2	5.66
	Online interview	1	
	Test	2	3.77
Type of data	Qualitative	24	47
	Quantitative	22	43
	Mix method	5	10
Subject	Science	3	6
	English	3	6
	General	32	64
	Health/medical	11	22
	ICT learning	1	2

3.3. Overall results categorized by research questions

Of the 50-article published, a total of 50 main research question were identified. A total 12 articles (24%) research examined the “What are needed and challenges to improve motivation and satisfaction during pandemic COVID-19.” While, a total 10 articles (20%) research focused on the factor and the relation of motivation and satisfaction with other variables and the relation of motivation and satisfaction with other variables. For the last question, there were 28 articles (58%) investigated the effect of online learning toward motivation and satisfaction during pandemic COVID-19. There were 22 articles (78.57%) showing that online/distance learning had a positive effect on learning motivation and satisfaction during the COVID-19 pandemic. Six articles (21.43%) show that online/distance learning adversely affected learning motivation and satisfaction during the COVID-19 pandemic as seen in Table 5.

There are several variables needed in online learning. Some of the key factors are proper mental, physical, and financial preparation to support the learning process [24]. In addition, ICT training is also needed prior to the learning process using the online method [26]. Teacher characteristics and intentions in applying technology are also needed to increase student motivation [27]. Other studies found that financial aspect is the variable needed in online learning that can impact on student motivation and satisfaction [28], [29]. Several articles have focused on the challenges of using the internet to learn during the COVID-19 pandemic. There are some challenges such as internet, ICT skills, and response [30].

There are many factors that influence the motivation and satisfaction of online learning during a pandemic. Platform availability has a significant impact on satisfaction, but user personal factors do not directly affect satisfaction [16]. In addition, there are many factors that affect motivation and satisfaction. Learning structure, classroom interaction, facilities, trainer knowledge [14]. In addition, collaboration between universities and the government is needed to produce good online learning [31], including to increase motivation and learning satisfaction.

Table 5. Result category by research question

Category of research question	N	%
What are needed	6	12
What are the challenges to held	6	12
What is the factor	5	10
What is the relation with other variables	5	10
What is the effect of online/distance learning toward motivation and satisfaction	28	58
Positive impact	22	78.57
Negative impact	6	21.43

Many articles focused to investigated the effect of online or e-learning toward motivation and satisfaction. This learning is considered effective because it corresponds to where many activities are limited and inefficient because it costs more [32]. In online learning, the materials provided are designed to be of interest to students, and digital content can be used to motivate students [71]. Online learning is effective in motivating students to learn, including interactive eBooks [13]. During the COVID-19 pandemic, online learning can be done with the virtual discussion method and this method is effective in increasing student motivation [33].

Despite many positive impacts on motivation and satisfaction, online learning also causes many problems. E-learning was mostly disrupted by factors related to home, internet data costs and unstable internet connectivity [34]. In addition, online learning can reduce motivation and satisfaction if there are many inequalities in the learning process. Differences in access to technology and financial stability, or the need for students and teachers to do extra work at home [35]. Therefore, future education strategies need to change, not just change the use of technology in education [36].

4. CONCLUSION

An important finding in this study was the significant change in motivation and satisfaction with online learning during a pandemic in which students in a particular major complained about very limited learning. Especially in experimental-based learning or psychomotor activity. Therefore, there must be special efforts made by policy makers in addressing and meeting the needs of student learning activities, especially increasing their motivation and level of satisfaction.

This article suggests that more systematic and strategic research through systematic reviews help researchers for better understanding toward the motivations and satisfaction of online learning during the COVID-19 pandemic. Recommendations from this study are a variety of strategies, techniques, methods, and learning for all education professionals, teachers, and teachers to achieve student satisfaction and motivation

in online learning during this pandemic. The model needs to be developed and implemented. So that even though the pandemic has ended, students are still enthusiastic and motivated to learn in an online situation. Future research on motivation and satisfaction in online learning may be better for developing new methods of technology use.

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