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In-Text Citation: (Ismail et al., 2023)
To Cite this Article: Ismail, F. A., Jaapar, N., Saidon, R., Ayob, M. A. S. Bin, & Mustaffa, F. (2023). Research Trends in Online Learning in Higher Education: A Systematic Review on Student Emotion (2017 – 2021). *International Journal of Academic Research in Business and Social Sciences*, *13*(7), 840 – 852.

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Research Trends in Online Learning in Higher Education: A Systematic Review on Student Emotion (2017 – 2021)

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Abstract

Online learning enables learners to learn everywhere and at any time in various forms and various educational activities including full-online, hybrid, blended, synchronous, and asynchronous. During the participation in these educational activities, emotions and personality play a significant role in parts of adaptive online learning systems among students. There is no review examining the broader aspect of research themes in online learning with student emotion in the last recent five years. Therefore, this paper presents a systematic review of university students' emotions in connection with virtual learning based on 50 articles published between 2017 and 2021. Hence, the objective was to analyse the articles for concepts and theoretical background related to virtual learning and emotions and examined for publication trends and patterns, research themes, research methods, and research settings and compared with the research themes from the previous decades. This study is through systematic literature reviews by descriptive research based on the document analysis on previous studies and literature on virtual learning and emotions from online journals, gained from web-based journals and articles indexed by Web of Science (WOS) and Scopus. The general finding of this article shows that 70% of the articles used quantitative methods and mixed methods. Students' emotions were mainly studied through online learning. Furthermore, the findings display that online learning in higher education is a growing field as evidenced by the increasing variety of research topics, methods, and researchers. All of the results were presented in detail with the relevant literature and recommendations for further research.

Keywords: Citation Analysis, Content Analysis, Online Learning, Research Trend, Students' Emotion

Introduction

Research on emotional experiences in classroom settings has grown in recent years especially during a Covid-19 pandemic because the educational system has shifted from physical education to full distance education or online learning (Uzunboylu and Akçamete,

2020). This shift has caused a disconnection of human interaction, yet it has also shown the immense potential of online learning and online education. We define online is activities vary according to the learning contexts and situations. For example, in flipped learning, individuals usually conduct online learning before class to prepare themselves and to build knowledge, often by way of watching videos of lecturers delivering classes via web-based technology (Binali et al., 2021). As education becomes increasingly digital, interaction becomes more diversified. Just as in a physical learning environment, in a virtual learning environment, students' emotion is influenced by interactions. These interactions play an important role in the learning process (Henritius et al., 2019). The effectiveness of online learning varied, which is as or more effective than offline learning for some target knowledge and skills and also the students despite the uncertainties of online learning it should be allowed in (Pei and Wu, 2019).

In the educational context, assessing student motivation and interaction are a key part in controlling the learning environment (Altuwairqi et al., 2021). Emotions are considered an important trait of the psychology of a student. Students are bound with different emotionally demanding states, such as homework, assignments, quizzes, examinations, and deadlines, are connected that encompass their psychological intentions. Students are expected to show patients and positive intentions toward the study (Ala et al., 2021). But the challenges of learning and implementing online have received many complaints from students ranging from stress, the body becomes sick, and boredom (Abdurrahman et al., 2021). Some researchers highlight the importance of monitoring students' emotions, and the way emotions can be detected as a reflection of student engagement (Jang et al., 2014).

Studies have shown that emotional experiences influence a student's motivation, learning strategies and achievement. Just as in a physical learning environment, in online learning environment, students' emotion is influenced by interactions. These interactions play an important role in the learning process (Noteborn et al., 2012; Henritius et al., 2019). Recent studies have acknowledged how negative emotions (anger, frustration, confusion, boredom, and isolation to name a few) and positive emotions (e.g., engagement, excitement) experienced by online learners inhibit or support the process of learning. Besides, Emotions have been constantly identified as one of the key factors in influencing online learning commitment (Zembylas, 2008; Henritius et al., 2019; Xing et al., 2019). Hence, negative emotional experiences increase students' metacognitive activities, and reduce their satisfaction level and motivation to continue with the learning (Noteborn et al., 2012) although as currently, e-learning systems are regarded as suffering from "emotional illiteracy" (Nassr et al., 2021) and even worse they can directly cause to fail an exam and even to drop out a course (Lacave et al., 2020).

According to Hasnine et al (2021), emotion in education is essential as it is highly associated with students' attention. Scholars are continuously researching different types of emotions. These include basic emotions such as anger, disgust, fear, happiness, sadness, and surprise. Nevertheless, previous research that modelled the relation between emotions and engagement rarely included excitement and thus gave little clue of the effect of excitement on engagement. Several qualitative studies of learner emotions also have shown that excitement is prevalent in and critical to online learning (Ding and Zhao, 2020). Although there were various discrete emotions, another researcher only selected only three academic emotions – enjoyment, anxiety, and boredom – because it is most frequently reported emotions in the context of online learning (You & Kang, 2014). However, teachers can't analyze students' learning mood and all basic emotion and state by observing their facial

expressions, so they can't timely adjust teaching strategies. In the modern education mode, the main purpose of teaching is to promote the all-round development of students especially emotional development (Wen *et al.*, 2020) The function of education is also to cultivate mental health talents not only to cultivate excellent talents.
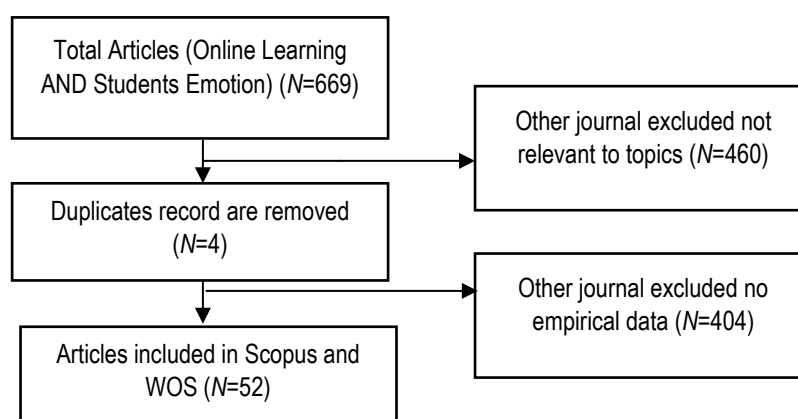
This research examined students' emotions in higher education and this study strives to address that gap by focusing on recent research themes found in the literature, and also reviewing research methods and settings. As students are attending online classes and e-practices for academics in higher education, there is a need to evaluate their emotions. Therefore, this study aims to review the studies on learning environments and special education and determine the trends in these studies. There are some themes that re-occur in the various reviews, and there are also new themes that emerge (Martin et al., 2020). While there have been review studies conducted on specific online learning topics, very few studies have been conducted on the broader aspect of online learning examining research themes with student emotion. Hence, the need for this systematic review which informs the research themes in online learning from past five years in 2017 to 2021. This study is aimed to analyse the articles for concept and theoretical background related to virtual learning and emotions as well as examine for publication trends and patterns research themes, research methods, settings and compared with the research themes from the previous decades.

Materials and Methods
Data Collection

This study has adopted descriptive research approach will highlight the general trend of the journal reviewed and to extract information regarding online learning and students' emotion through the document analysis published from 2017 to 2021. These articles were searched by the researchers and a total number of 52 articles were obtained at the end of the data collection. Content analysis and citation analysis were also used in this research as a research model. The review was based on articles drawn from web-based journals and articles indexed by Web of Science (WOS) and Scopus. The relevant published articles selected included those with the keyword's education and e-learning found from a simple search of peer review publications and academic journals, in English since 2017.

The published documents were obtained through searching key-words 'online learning' and 'students' emotion' in order to reveal the current situation and trends in this area. It was expected that the chosen scope would be more frequently covered in the more recent journals due to the digitalization of learning.

Data Analysis
Themes 1: Indexed Journal of publication

Content analysis criteria were indicated to review the collected data. The following criteria were used to define the studies to be included in the review includes year of publication, name of the journals, countries, document type, subject area, research approach, keywords and most cited publication. To be included for further reading, we selected articles that included students' emotion and online learning-related concept either in the title or the abstract, keywords, aims, research questions, hypotheses or the research results for the following search terms.

Databases	Keyword Used
Scopus	TITLE-ABS-KEY (({online learning} OR {learning online} OR {onlinelearning})) AND (({students' emotion} AND {higher education}))
Web of Science	TS= (("online learning" OR "learning online" OR "onlinelearning")) AND (("students' emotion" AND "higher education"))

Results
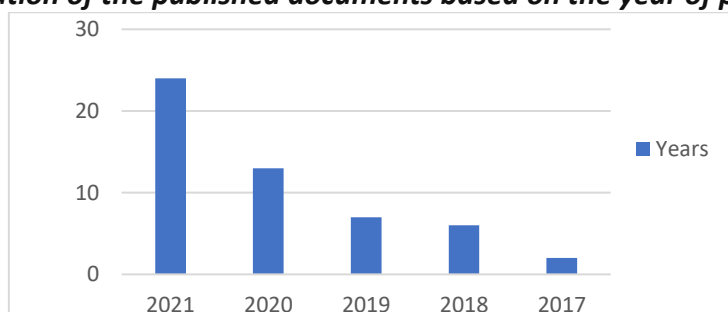### *Theme 2: Distribution of the published documents based on the year of publication*

Figure 1. Distribution of the articles based on the year of publication

Publication based on the year of publication of the 52 articles reviewed from the 41 journals are presented in figure 1. When disaggregated by year, the total frequency of publications shows an increasing trend. Results showed that the number of published documents increased regularly compared to previous years and the highest number of publications is in 2021 with 24 publications (46.2%). Besides, results showed that there thirteen articles (25%) published in 2020, seven articles (13.5%) published in 2019, six articles (11.5%) in 2018 and two articles (3.8%) in 2017.

Theme 3: Distribution of the published documents based on the name of the journals
Table 1
Name of the journals in which the documents published

Journal	*f*	(%)
Computers & Education	8	15.4
The Internet and Higher Education	3	5.8
International Journal of Human-Computer Studies	2	3.8
Frontiers in Psychology	2	3.8
System	2	3.8
Other Journals	35	67.3
Total	**52**	**100**

Distribution of the articles based on the name of the journals is shown in Table 1. *Computers & Education* had the highest number of publications in this review (15.1%). This result is followed by *The Internet and Higher Education* with three publications (5.7%); *International Journal of Human-Computer Studies*, *Frontiers in Psychology* and *System* with two publications (3.8%) and other journals with one publication (67.9%). The last 35 journal names are not shown in the table, because the frequency of other journals was one and these journals constituted 67.3% of the 52 documents.
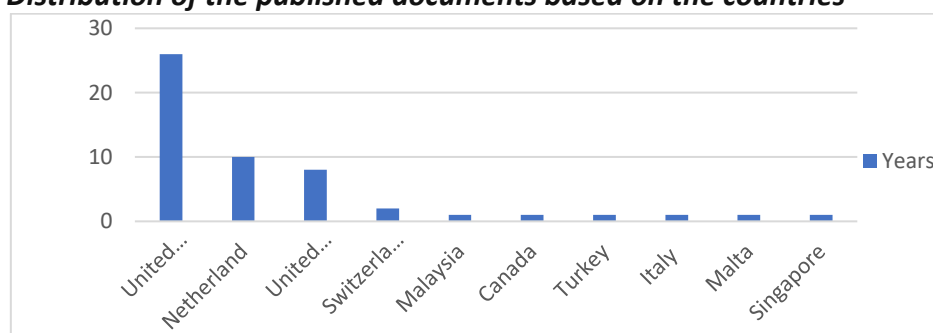
Theme 4: Distribution of the published documents based on the countries

Figure 2. *Countries of the publications*

Figure 2 shows the ranked list of publications based on geographical affiliation. According to the publication above, as many as 10 countries have published articles related with online learning and students' emotion in WOS and Scopus. Publication in United Kingdom as first country which consists of 26 articles (50%) from the overall research articles. As the second frequent country of the publication, there were ten from Netherland (19.2%) and there were eight from United States (15.4%). Another country like Switzerland consists two publication (3.8%) and the other remaining countries constituted the 1.5% each one with one publication from Malaysia, Canada, Turkey, Italy, Malta and Singapore.
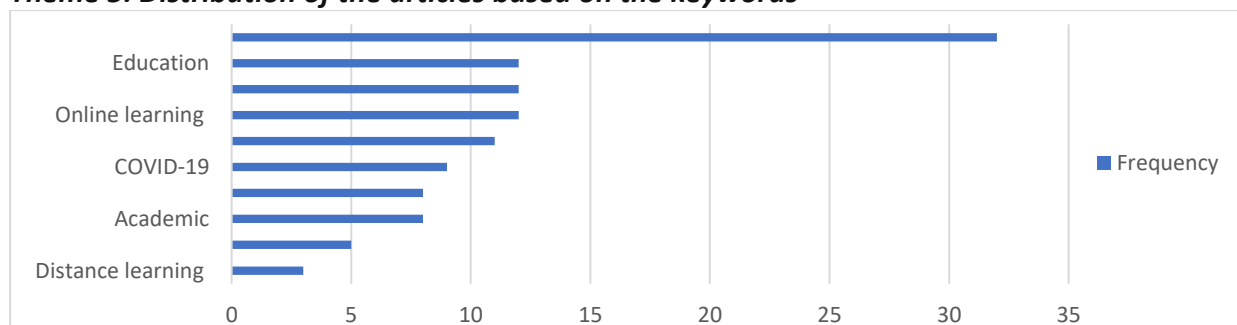
Theme 5: Distribution of the articles based on the keywords

Figure 3. Keywords used in the published documents

Figure 3 shows the distribution of the articles based on the keywords mentioned in the published documents. The top 10 frequently used keywords are involved in the figure. As presented, the keywords 'emotion' has been observed as the most used keyword in the published documents (*f*=32). Moreover, this result is followed by 'Education', 'Engagement', 'Online Learning', 'Student', 'COVID-19', 'Digital', 'Academic', 'Motivation' and 'Distance Learning' were the other mostly used keywords.

Theme 6: Distribution of the Research Approaches of Each Publication
Table 2
Research Approaches of Each Publication

		Frequency *(f)*	Percentage (%)
Research Approach (n=52)	Analytical	4	7.7
	Descriptive	15	28.8
	Empirical	28	53.8
	Exploratory	5	9.6
Method (n=52)	Qualitative	14	26.9
	Quantitative	19	36.5
	Mixed Method	19	36.5

Research approaches and research methodology is an important process in gathering an information for a research. there are four commonly used types of research; analytical, descriptive, empirical and exploratory research. Analytical research attempts to establish why it is that way or how it came to be. The analytical research usually concerns itself with cause-effect relationships. Descriptive research attempts to determine, describe, or identify what is. The descriptive research uses description, classification, measurement, and comparison to describe what phenomena are. Empirical research methods are a class of research methods in which empirical observations or data are collected in order to answer particular research questions. Exploratory research is made if few or no previous studies exist and predictive research is to speculate on future possibilities after further analysis of available proof of cause and effect (Johari et al., 2014). Most publications contained all of four aforementioned research types. Based on the analysis done on the 52 articles, most researchers use empirical approaches with a total of 28 research approaches and the lowest research approach recorded is 4 which is a analytical approach.

There are three types of research approaches that suggested by the previous scholar which are qualitative (subjective approach), quantitative (numerical approach) and mix method (combine from both approaches) (Ayob, 2021). In the articles selected for this review,

based on the research data collected, over the past 5 years a quantitative approach and mixed method was the most commonly used (19) followed by qualitative approaches (14).

The most cited documents on research methods and special education in Scopus

No.	Document title	Author(s)	Year	Source	Cited by
1.	Online e-learning and cognitive disabilities: A systematic review	Cinquin et al (2019)	2019	Computers and Education	50
2.	The effect of self-regulated learning on college students' perceptions of community of inquiry and affective outcomes in online learning	Cho et al (2017)	2017	Internet and Higher Education	50
3.	Perceived stress among students in virtual classrooms during the COVID-19 outbreak in KSA	AlAteeq et al (2020)	2020	Journal of Taibah University Medical Sciences	38
4.	Influence of satisfaction and preparedness on online students' feelings of anxiety	Abdous (2019)	2019	Internet and Higher Education	34
5.	Chronicling engagement: students' experience of online learning over time	Muir et al (2019)	2019	Distance Education	31
6.	Beyond positive and negative emotions: Looking into the role of achievement emotions in discussion forums of MOOCs	Xing et al (2019)	2019	Internet and Higher Education	28
7.	Students' experiences of anxiety in an assessed, online, collaborative project	Hilliard et al (2020)	2020	Computers and Education	24

8.	Boredom in online classes in the Iranian EFL context: Sources and solutions	Derakhshan et al (2021).	2021	System	24
9.	University students' emotions in virtual learning: a review of empirical research in the 21st century	Henritius et al (2019)	2019	British Journal of Educational Technology	21
10.	Cognitive emotions in E-learning processes and their potential relationship with students' academic adjustment	D'errico et al (2018).	2018	International Journal of Emotional Education	17

Table 3. The most cited documents on research methods and special education in Scopus

Table 3 illustrates the most cited documents on online learning and students' emotion in Scopus. The top 10 most frequently cited documents are included. As it can be seen, the article with the highest citations was published in 2017 and 2019 with 50 citations. This shows that article was published earlier have a greater chance of being accessed and cited. This result is followed by an article with 38 citations in 2020; an article with 34 citations in 2019 and an article with 31 citations in 2019. In addition, among top 10 most cited was published in 2019.

Discussions

This review enabled us to identify the online learning and students' emotion research themes examined from 2017 to 2020. Regardless of the issues, students' emotion in online learning is very important in terms of determining learners' engagements and participation, especially emotional engagement encompasses positive and negative reactions to teachers, classmates, and academics (Dewan et al., 2019). The need and request for online education continues to grow as students find that the flexibility of online learning. The rapid growth of online learning in higher education has also benefited from the potential cost savings for limitless students. Previous research has analyzed the applicability and classification of learning styles by exploring a set of instruments aimed at identifying individual learning styles, learning environment and special education (Uzunboylu & Akçamete, 2020; Rodrigues et al., 2019). The analysed documents were found by searching the WOS and Scopus and a total number of 52 published articles were analysed in the review based on the content analysis criteria. The number of published papers showed a regular increase especially after spread of COVID-19 in the end 2019 when compared to previous years and the highest number of publications is in 2021 with 24 publications.

The review showed that the most common number of publications were in Computers & Education related to online learning and students' emotion with 8 publications. Results also indicated that research about online learning and students' emotion were mostly conducted in United Kingdom. This result revealed that many researchers intensively use to publish their articles within publication from United Kingdom and it indicates that many publications from United Kingdom were WOS and Scopus indexed. It is in addition, it was also figured out that

The Netherland, United States and Switzerland were the other countries with the highest number of publications. Furthermore, results showed that the most frequently used keywords in the published documents is 'emotion', 'education', 'engagement', 'online learning' and 'student' were found to be the key variables. This is might be related with majority of the emotion-related concepts in online learning and students' emotion (Uzunboylu & Akçamete, 2020).

Another result from this study indicated that most of the research in this field tended to use a quantitative and mix method rather than qualitative approach for their research methodology. About this result, it can be interpretted that future research might use interview method as a quantitative and mix research method more frequently in order to obtain information about the opinions of students' (Demirok et al., 2015). The patterns of the publication by method were not consistent across the 52 articles. In addition, most authors prefer to use empirical and descriptive research method to answer particular issues on online learning and students' emotion in countries or area of study which arise. Studies focusing on learning outcomes were usually quantitative in nature as they were examining achievement and performance variables (Martin et al., 2021). Meanwhile exploratory and analytical method did not gain popularity in most articles within this area. Finally, this study revealed that the highest citations was published in 2017 and 2019 with 50 citations from Computers and Education.

Conclusion

This study was essentially a mixed methods approach which investigate and allowed the collection of data that described the online learning and students' emotion by the numerical and categorical data. The study is limited to a relatively narrow selection of journals, and it is possible that another selection might have produced different outcomes. Online learning is developing rapidly. Future systematic reviews should consider reviewing published scholarship with a focus on the research designs in conjunction with categories coded in this paper, such as methodologies, themes, content area, and participants. In addition, different academic databases should be analysed in order to reveal the trends in published papers on learning environments and special education. Although there are few researches investigate the effect of online learning on students' personal emotion, we believe that there is a need to dig deeper in researching about what happened among students during online learning especially when we are integrating technology.

Acknowledgement

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