

A Systematic Review of Student's Satisfaction towards Online Learning in Secondary Education during COVID-19 Pandemic Period

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Abstract

The purpose of this research is to review student's satisfaction towards online learning in secondary education during COVID-19 pandemic period by examining a variety of relevant papers. This article provides a systematic literature review on student satisfaction (SS) regarding online learning and teaching research published from 2020 to 2023. The review uses data from the Google Scholar, Medley, Scopus, Semantic Scholar and other open resource database using relevant keywords such as student satisfaction, online learning factors of student satisfaction. 10 highly cited papers were selected from 40 articles for this systematic literature review. Satisfaction is a critical aspect of student success in online education. In this systematic review, 40 articles are examined which studied various aspects of online learner satisfaction. Publication patterns, context, research methodology, research instruments, research themes and factors pertaining to online learner satisfaction research and finding of the study is specifically analyzed. Among these 40 studies, majority were conducted out of India. Thirty five percent of the studies were conducted with undergraduate students. In majority of the studies research methodology used was cross sectional research and descriptive survey; some of the researches were carried out through experimental study. Learner characteristics were the most examined theme, followed by engagement and course delivery. Program quality, assessment, and learner support were some of the themes that were least studied. In some of the studies researchers adopted or modified existing items or instruments to measure student satisfaction. Among these 40 studies most of the research was done in higher education, medical education. Very few researches were carried out for secondary education for measuring the student's satisfaction in online education during COVID-19 pandemic period. The framework benefits both online learning practitioners and researchers. This paper contributes to the online education domain by providing research directions and implications for future researchers. In conclusion, the study confirmed that the online mode of education adequately explains the causal relationships between variables and presented direct and indirect significant impact on Online Learning Student Satisfaction (OLSS), promoting learners' better academic performance and knowledge acquisition.

Keywords: Student Satisfaction, Online education, Student Satisfaction factors

Introduction

The COVID-19 pandemic was first out broken in early 2020. It considerably landscaped the Secondary

education globally. To restrain viral transmission, universities and other educational institutions globally locked down thus transferring the teaching and learning activities from offline platform to online platforms.

Although online learning is a relatively mature learning model and is increasingly integrated into secondary education, the sudden and unprepared transition to wholly online learning caused by the pandemic posed formidable challenges to secondary education stakeholders, e.g., policymakers, instructors, and students, especially at the early stage of the pandemic (García-Morales et al., 2021; Grafton-Clarke et al., 2022). Pandemic posed formidable challenges to higher education stakeholders, e.g., policymakers, instructors, and students, especially at the early stage of the pandemic (García-Morales et al., 2021; Grafton-Clarke et al., 2022). Correspondingly, the effectiveness of online learning during the pandemic period is still questionable as online learning during this period had some unique characteristics, e.g., the lack of preparation, sudden and unprepared transition, the huge scale of implementation, and social distancing policies (Sharma et al., 2020; Rahman, 2021; Tsang et al., 2021; Hollister et al., 2022; Zhang and Chen, 2023). This question is more prominent in developing or undeveloped countries because of insufficient internet access, network problems, lack of electronic devices, and poor network infrastructure (Adnan and Anwar, 2020; Muthuprasad et al., 2021; Rahman, 2021; Chandrasiri and Weerakoon, 2022). Learning effectiveness is a key consideration of education as it reflects the extent to which learning and teaching objectives are achieved and learners' needs are satisfied (Joy and Garcia, 2000; Swan, 2003). ICTs have fundamentally shaped the process of learning as they allow learners to learn anywhere and anytime, interact with others efficiently and conveniently, and freely acquire a large volume of learning materials online (Choudhury and Pattnaik, 2020). Such benefits may be offset by the challenges brought about by the pandemic. A lot of empirical studies globally have investigated the effectiveness of online learning but there is currently a scarcity of a systematic review of these studies to comprehensively evaluate student satisfaction in online learning, effectiveness and identify factors that influence effectiveness. At present, although the vast majority of countries have implemented opening policies to deal with the pandemic and secondary education institutes have recovered offline teaching and learning, assessing the effectiveness of online learning during the pandemic period via a systematic review is still essential. First, it is necessary to summarize, learn from, and reflect on the lessons and experiences of online learning practices during the pandemic period to offer implications for future practices and research. Second, the review of online learning research carried out during the pandemic period is likely to generate interesting knowledge because of the unique research context. Third, secondary education institution still needs a contingency plan for emergency online learning to deal with potential crises in the future, e.g., wars, pandemics, and natural disasters. A systematic review of research on the effectiveness of online learning during the pandemic period offers valuable knowledge for designing a contingency plan for the future. In addition, online learning has altered educational objectives and learning requirements. Memorizing knowledge was traditionally viewed as vital to learning but it is now less important since required knowledge can be conveniently searched and acquired on the Internet while the reflection and application of knowledge becomes more important (Gamage et al., 2023). Online learning also entails learners' self-regulated learning ability more than traditional learning because the online learning environment inflicts less external regulation and provides more autonomy and flexibility (Wong et al., 2019). The above differences imply that traditional pedagogies may not apply to online learning. The present review

focuses on wholly online learning and student satisfaction because the review is interested in the COVID-19 pandemic context where learning activities are fully switched to online platforms.

Online Learning

Online learning should not be simply understood as learning on the internet or the integration of ICTs with learning because it is a systematic framework consisting of a set of pedagogies, technologies, implementations, and processes (Choudhury and Pattnaik, 2020). Choudhury and Pattnaik (2020) summarized prior definitions of online learning and provided a comprehensive and up-to-date definition, i.e., online learning refers to “*the transfer of knowledge and skills, in a well-designed course content that has established accreditations, through an electronic media like the Internet, Web 4.0, intranets and extranets.*” Online learning differs from traditional learning because of not only technological differences, but also differences in social development and pedagogies (Camargo et al., 2020). In addition, online learning has altered educational objectives and learning requirements. Memorizing knowledge was traditionally viewed as vital to learning but it is now less important since required knowledge can be conveniently searched and acquired on the internet while the reflection and application of knowledge becomes more important (Gamage et al., 2023). Online learning also entails learners’ self-regulated learning ability more than traditional learning because online learning environment inflicts less external regulation and provides more autonomy and flexibility (Wong et al., 2019). The above differences imply that traditional pedagogies may not apply to online learning.

Students Satisfaction

The COVID-19 outbreak has globally altered educational scenarios by converting traditional learning to alternative remote counterparts or DL to deter infectious disease transmission through social interaction (Li et al., 2020; Wang et al., 2020) and adversely impacts students' lives, grades, and learning achievements (Naji et al., 2020). Notwithstanding, ICT-facilitated online learning is not explicitly associated with COVID-19. For example, online learning activities affect learning objectives, course delivery plans, and assessment activities that differ from conventional delivery modes (Cobb, 2009). As online study or DL (not a novel phenomenon) engages students from distinct study fields, the individuals portray diverse opinions on online learning programmes (Zolotov et al., 2020). Although online learning modules offer experiential and constructive learning environments, most students perceive online learning to be challenging as first-time online learners during COVID-19 (Demuyakor, 2020). Online learning encompasses online lecture delivery, audiovisual aids (A-VAs), PowerPoint slides, and recorded video lessons (Baber, 2020). Although most students encountered intricacies in online learning delivery, many felt equally comfortable with the novel instruction delivery mode (Zolotov et al., 2020). Students' online learning satisfaction requires advanced teaching pedagogies and technological know-how to grow students' attention and instruction delivery (Baber, 2020; Hsu et al., 2019). For example, one-to-one student-teacher interaction within a DL setting created complexities in higher engagement levels in terms of resource allocation and priorities (Baber, 2020). Although perspectives of technological usage and learners' self-efficacy significantly impacted online learning satisfaction (Naji et al., 2020), research on technology-related self-efficacy that induced learning satisfaction remained scarce. Thus, it was deemed crucial to examine the online learning self-efficacy impacts on online learning satisfaction during COVID-19.

Previous Review Research

Researcher	Research Entailed	Research Design	Sample	Context	Outcome Variable	Major Finding	Satisfaction or not
Almusharraf and Khairo (2020)	Students satisfaction with online learning experiences during the COVID-19 pandemic	Cross-sectional survey	283 Saudi undergraduate students	Multiple subjects	Student satisfaction	1. The majority of participants were satisfied with online learning. 2. The research findings also showed that participants were highly satisfied with Google Hangouts the most for lecture delivery, followed by Google Classroom and LMS (Moodle) for course management and assessments.	Satisfaction
Sharma et al. (2020)	Online learning in the face of COVID-19 pandemic: assessment of students' satisfaction	Cross-sectional survey	434 medical students from Nepal	The spring semester of 2021; Medical education	Student satisfaction with coordination, technological characteristics,	Participants were satisfied with coordination, technological characteristics, course management, and instructor	Satisfaction

	at Chitwan medical college of Nepal. Kathmandu Univ.				course management and instructor characteristics	characteristics . Overall satisfaction is positively correlated with all four dimensions.	
Mok et al. (2021) Not	COVID-19 pandemic's disruption on university teaching and learning and competence cultivation: student evaluation of online learning experiences in Hong Kong.	Cross-sectional survey	1,227 university students from Hong Kong	May 2020; Multiple subjects	Satisfaction with online learning experience	The majority of participants were dissatisfied with online learning experience. Satisfaction is positively influenced by family income and IT proficiency.	Satisfaction
Tsang et al. (2021)	Higher education during the pandemic: the predictive factors of learning effectiveness in COVID-19 online learning	Cross-sectional survey	409 undergraduate students from 11 universities in Hong Kong	At the end of the spring semester of 2020; multiple subjects	Student satisfaction	Student satisfaction is positively associated with both student initiative and learning outcomes. Student initiative is positively influenced by instructor-	Neutral

						student dialog; learning outcomes are positively influenced by student–student dialog and course design.	
Al-Nasa' h, et al. (2021)	Estimating students' online learning satisfaction during COVID-19: A discriminant analysis	Cross-section al survey	27 public and private Jordania n universiti es	As this Study was conducted in educationa l settings among higher education institution s (universiti es) with human subjects, a five member committee from the School of Education al Sciences (Committe e of Reviewing Ethics and Protocols Of scientific	online self efficacy, general anxiety, fear of COVID-19, and online learning satisfacti on	This study theoretically justified the essentiality of online learning self efficacy towards online learning satisfaction. High online learning satisfaction levels occurred with high online self-efficacy, moderate general anxiety, and low fear of COVID-19.	Students with moderate satisfactio n levels revealed moderate self efficacy with low anxiety and fear of COVID-19. Students with high satisfactio n levels exhibited high self efficacy and fear of COVID-19 and low anxiety.

				research) approved the research protocol in line.			
Sri, P., Suci Ningsih et al. (2023)	EFL High School Students' Satisfaction in Online Learning And Expectations Towards Blended Learning: An Investigation	Explanatory Sequential Mixed-Method	368 EFL students North Bali, Indonesia	12 senior High school Students in the academic Year 2022/2023	Students' Satisfaction	The results showed that students had a mode score of 4, indicating students feel satisfied with online learning during COVID-19. This research provide insight for teachers to improve student satisfaction with online learning and blended learning practices	Satisfaction
Hettiarachchi, S et.al (2021)	Student Satisfaction with Online Learning during the COVID-19 Pandemic: A Study at	Cross-sectional survey	1376 undergraduate student at state university Sri Lanka	Enrolled In owned various courses in humanities and social sciences at three	Dependent Variable (Perceived Students' Satisfaction) Independent	The students that they surveyed in Sri Lankan universities were satisfied with their online learning experience	Satisfied on the basis of different factors

	State Universities in Sri Lanka			state universities in the country	Variable (Perceived challenges of e-learning, perceived learner motivation, interaction)	despite various challenges that they had encountered.	
Zaheer, M. et al. (2020)	E-learning and Student Satisfaction	Cross-sectional survey design	21608 students participated in the study	Higher Education Commission of Pakistan (HEC)	Students' Satisfaction	Results indicate that majority of the students are satisfied from the education received in e-Learning mode which shows e-learning has a lot of potential in augmenting higher education in a country like Pakistan where capacity of higher education institutes is limited	Satisfaction

Sang, S (2023)	Students' Online Learning Satisfaction, Self-efficacy and Academic Performance	Exploratory research design quantitative study	100 students who were in their fifth, sixth, and seventh grades from the Zhaiyingdajie Elementary School and the Affiliated Middle School of Beijing Normal University in Shijiazhuang City, Hebei Province	Elementary School and the Affiliated Middle School	Self-efficacy, online learning satisfaction	Firstly, this study not only suggests that elementary school and middle school children in China tend to have high confidence in their ability to learn knowledge online but also indicates that there is a positive correlation between students' online learning self-efficacy and their examination scores gained throughout the online semester. Secondly, the study shows that students in the 5th, 6th, and 7th grades are generally	Satisfaction
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						satisfied with online education	
Zeqiri, J., et.al (2021)	Blended Learning and Student Satisfaction: The Moderating Effect of Student Performance	Quantitative research design	Three hundred and nineteen (319) students of South-East European University (SEEU) in North Macedonia. The selected university	Bachelor and master study programme.	Student Satisfaction, Student Performance	Course management and interaction positively impact students' satisfaction and performance. The interaction has a more significant effect on both satisfaction and performance outcomes from blended learning. The main conclusion is that blended learning contributes to students' satisfaction which eventually leads to students' improved performance.	Satisfaction

Purpose of the Review Research

The research is carried out based on a systemic review of past empirical research to answer the following two research question;

Q1: To what extent online learning in secondary education was effective during COVID-19 Pandemic Period?

Wisdom, Endang Hermawan, Aldim, Irwandi (2020) conducted a study entitled "Effectiveness of Online Learning during the Covid-19 Pandemic Period: An Online Survey" of home learning policies by implementing online learning using the Zoom application for face-to-face and WhatsApp to provide lecture material and assignments for online learning media. The test results found that online learning with Zoom and WhatsApp is only effective for theoretical and theoretical courses and practicum, while in online lecture practice and course subjects are less effective. Yensy (2020) conducted a study entitled "Effectiveness of Mathematical Statistics Learning through Whatsapp Group Media Judging from Student Learning Outcomes (COVID Pandemic Period 19) ". The results of the research showed that the Mathematics Statistics Course at the Mathematics Education Study Program Department of Mathematics and Natural Sciences Faculty of Bengkulu University using WhatsApp Group media is quite effective when viewed from student learning outcomes. Student learning outcomes after lectures using Whatsapp Group are higher than student learning outcomes before lectures using Whatsapp Group. However, this learning still has some weaknesses, including signals that are difficult to reach by students who live in the area, a lot of chat that makes the cellphone memory full so that the internet connection is slow and quite tiring because they have to go back and forth to see the chat from the beginning of learning. Those who are interested in conducting similar research should be able to apply to learn and compare with other online media, given the lack of learning through Whatsapp Group media. This study aims to find out online learning media that can make students enthusiastic about attending lectures, especially at University Economics Faculty students West Sulawesi, which has just implemented an online learning system during the COVID-19 Pandemic. In addition to knowing effective learning media for students of the Faculty of Economics, University of West Sulawesi, this study was also carried out as a strategy of the Faculty of Economics of the University of West Sulawesi in maintaining the enthusiasm of students so that they can keep their enthusiasm for online learning in the Pandemic Era COVID-19. Yao et al. (2020) discussed the teachers' role in online teaching during the COVID-19 pandemic. The study compared the recorded video versus live broadcasting for students' performance. The research concluded that live broadcasting where the teacher-student interaction is involved is better, and the students' academic performance is improved. Students potentially will have greater satisfaction with online learning if the system is straightforward to use, and they have to put less effort into comprehending and utilizing it (Jongkolthanalarp et al., 2021).

Q2: What factors shaped the student satisfaction toward online learning in secondary education during the COVID-19 Pandemic Period?

Online Learner Factors

Alqurashi (2019) investigated 167 online students and found that online learner self-efficacy was the strongest and most significant predictor of perceived learning, and a very important predictor of students' OLS. In a questionnaire survey about students' stay-at-home online learning with a sample of 428 Chinese undergraduate EFL learners, Han et.al, (2021) confirmed the significant mediating role of

self-efficacy in students' OLS. Some other learner-related factors have been found in affecting OLS, such as student engagement (Gao et.al, 2020; Han et.al, 2021; She et.al, 2021; Sinval et.al, 2021), learner-learner interaction, learner-instructor interaction, learner's interaction with content (Knowles et.al, 2020; Kim and Kim, 2021). Hettiarachchi et.al, (2021) also found no significant influence of gender and age on students' OLS. Their findings may be affected by sampling biases in that the majority of the participants were female students, accounting for 88.3%, and male participants only accounted for about 11.7%. Another possible reason for the differences in their findings is differences in size of the samples. Further, the anticipation of the overall usability of hospitality and tourism courses likely links to student satisfaction and learning outcomes (Chandra et al., 2022).

Online Instructor Factors

Interaction between learners and instructors is the most important factor determining OLS (Xu et.al, 2017; Baber, 2020, 2021). And She et. al, (2021) took a cross-sectional, questionnaire-based investigation of 1,504 Chinese university students and found a significant positive relationship between learner-instructor interaction and OLS. It was also revealed that learners' self efficacy and engagement serial mediated the relationship between learner instructor interaction and OLS. It was found that the proportion of teachers presented in video courses has a negative impact on learners' satisfaction. With the continuous development of big data technology and cloud computing technology, recent years have witnessed some larger-scale studies on OLS (Ullmann and Rienties, 2021). Langan and Harris (2019) analyzed over 1.8 million National Student Survey returns and found long term stability of the predictors of OLS. It was found that the survey items related to "Teaching" was of significant influence, such as "Staff are good at explaining things," "Staff have made the subject interesting," and "Staff are enthusiastic about what they are teaching," with the first item being particularly important (Langan and Harris, 2019), showing that the teacher and teaching factors are always more important than the learner factors. Besides, based on econometric modeling of 21,096 undergraduate student responses and 4,429 postgraduate student responses to the module evaluation questionnaire, Sutherland et al. (2019) found that the helpfulness of lectures and seminars provided by teachers, involving direct student-teacher contact time, is the most significant influencing factor of OLS. Learner-learner interaction continues to be a significant predictor of SS (Baber, 2020), students are still likely to be satisfied if they have high-quality interactions with their instructors.

Online Platform Factors

Online learning can be classified into synchronous online course and asynchronous online course (Imssard, 2020), the former being a real-time lecture provided through such video conferencing systems as ZOOM, Tecent Meeting and Webex Meetings and the latter being a pre-recorded lecture and some related course materials uploaded by the teacher onto such learning management systems as Blackboard and CANVAS . There also needs to be a well-established internet infrastructure (Zhou et al., 2020), which is necessary to provide a comprehensive and successful online learning experience. Moreover, inconsistent and unreliable Internet access significantly influences students' satisfaction (and teachers) in their use of online education, as is the necessary Internet bandwidth for online students to complete required course assignments.

Online Instructional Design Factors

A review of over 1.8 million National Student Survey returns, Langan and Harris (2019) found that good organization and smooth running of the course was the most influential among all the factors influencing OLS. Moreover, Dhawan (2020) and Faize and Nawaz (2020) identified technological difficulties as significant challenges students face in online education. Several other researchers have also suggested that improved technology is a critical component in making online education effective (Faize and Nawaz, 2020; Hebebcı et al., 2020; Nonthamand et al., 2021).

Limitations

There are some methodological limitations to this systematic review. First, only ten databases were used in this review. Undoubtedly, other relevant articles exist that were not included in this review. Second, the number of search terms was limited to words such as satisfaction, student or learner, online or virtual, or e-learning. If authors used different terms or combination of terms, most likely, the article was not included in this review. Third, the review only included articles written in English. Research articles that report findings from online student satisfaction studies in other languages were not included in this review. Last, up to three research themes were coded in this systematic review. Some of the included articles investigated a plentitude of themes.

Implications and Future Directions

One of the strengths of this review is the development of the online learner satisfaction framework. This framework succinctly summarizes what has been learned from this review and identified important aspects for online learner satisfaction in the last decade. This multidimensional framework of online learner satisfaction assists instructors, instructional designers, and administrators to focus on four aspects of online learner satisfaction: learner, course, instructor, program, and organization. For example, the research themes such as learner characteristics during the design of the course and learner engagement during the delivery of the course are important for online learner satisfaction. These two elements were studied the most. This framework can be used by other researchers to build upon their research studies or practitioners to use during the design process. This review also provides researchers with guidance on most studied and least studied satisfaction themes, contexts, study participants and research methodologies. The various factors that are tabulated can be used by researchers for the development of instruments to measure online learner satisfaction. The majority of studies was quantitative and used survey-based methods. Some of the instruments were limited in scope or were dated. There is a need for a more comprehensive and updated scale to measure online learner satisfaction. Additionally, researchers may want to consider qualitative or mixed methodologies in their future study designs such as interviews and focus groups to study online learner satisfaction.

Conclusion

This study carried out a systematic review of 10 empirical studies published between 2020 and 2023 to evaluate the effectiveness of online learning during the COVID-19 pandemic period. On analyzing research methodology components, it was found that the majority of the studies in this review were quantitative. Therefore, online learner satisfaction has been studies mostly through a quantitative lens and not through a qualitative lens. Only one study used qualitative research method and other 9 studies

used mixed-methods. This fact points towards the need for more qualitative and mixed-method studies. Additionally, most researchers utilized survey instrument for the collection of data. The use of other data collection instruments and data collection methods to collect qualitative data will be encouraged in future studies. In conclusion, this study found that student satisfaction in online learning, better represented as Emergency Remote Teaching in some recent literature, is closely related to student motivation, challenges of e-learning, and interaction.

Bibliography

1. Adnan, M., and Anwar, K. (2020). Online learning amid the COVID-19 pandemic: Students' perspectives. *J. Pedagogical Sociol. Psychol.* 1, 45–51.
2. Almusharraf, N., and Khahro, S. (2020). Students satisfaction with online learning experiences during the COVID-19 pandemic. *Int. J. Emerg. Technol. Learn. (iJET)* 15, 246–267.
3. Al-Nasa'h, M., Al-Tarawneh, L., Abu Awwad, F. M., & Ahmad, I. (2021). Estimating students' online learning satisfaction during COVID-19: A discriminant analysis. *Heliyon*, 7(12), e08544.
4. Shodh Drishti (An International Peer Reviewed Refereed Research Journal) Impact Factor : 7.0
5. Vol. 16, No. 2.1, February 2025 ISSN : 0976-665040
6. Alqurashi, E. (2019). Predicting student satisfaction and perceived learning within online learning environments. *Distance Educ.* 40, 133–148.
7. Arthur-Nyarko, E., Agyei, D. D., & Armah, J. K. (2020). Digitizing distance learning materials: Measuring students' readiness and intended challenges. *Education and Information Technologies*, 25(4), 2987–300
9. Baber, H., 2020. Determinants of students' perceived learning outcome and satisfaction in online learning during the pandemic of COVID-19. *J. Educat. e-Learn. Res.* 7 (3), 285–292.
10. Barnard-Brak, L., Paton, V. O., and Lan, W. Y. (2010). Profiles in self-regulated learning in the online learning environment. *Int. Rev. Res. Open Dist. Learn.* 11, 61–80.
11. Camargo, C. P., Tempski, P. Z., Busnardo, F. F., Martins, M. D. A., and Gemperli, R. (2020). Online learning and COVID-19: a meta-synthesis analysis.
12. Chandra, S., Ranjan, A., & Chowdhary, N. (2022). Online hospitality and tourism education - issues and challenges. *Tourism: An Chandrasiri, N. R., and Weerakoon, B. S. (2022). Online learning during the COVID-19 pandemic: perceptions of allied health sciences undergraduates. Radiography* 28, 545–549.
13. Choudhury, S., and Pattnaik, S. (2020). Emerging themes in e-learning: A review from the stakeholders' perspective. *Computers and Education* 144, 103657.
14. Cobb, S.C., 2009. Social presence and online learning: a current view from a research perspective. *J.Interact. Online Learn.* 8 (3), 241–253.
15. Demuyakor, J., 2020. Coronavirus (COVID-19) and online learning in higher institutions of education: a survey of the perceptions of Ghanaian international students in China. *Online J. Commun. Media Technol.* 10, e202018.
16. Gamage, D., Ruipérez-Valiente, J. A., and Reich, J. (2023). A paradigm shift in designing education technology for online learning: opportunities and challenges. *Front. Educ.*
17. García-Morales, V. J., Garrido-Moreno, A., and Martín-Rojas, R. (2021). The transformation of higher education after the COVID disruption: emerging challenges in an online learning scenario. *Front. Psychol.* 12:616059.

18. Grafton-Clarke, C., Uraiby, H., Gordon, M., Clarke, N., Rees, E., Park, S., et al. (2022). Pivot to online learning for adapting or continuing workplace-based clinical learning in medical education following the COVID-19 pandemic: a BEME systematic review: BEME guide no. 70. *Med. Teach.* 44, 227–243.
19. Han, J., Geng, X., and Wang, Q. (2021). Sustainable development of university EFL learners' engagement, satisfaction, and self-efficacy in online learning environments: chinese experiences. *Sustainability* 13:11655.
20. Hettiarachchi, S.; Damayanthi, B.; Heenkenda, S.; Dissanayake, D.; Ranagalage, M.; Ananda, L. Student Satisfaction with Online Learning during the COVID-19 Pandemic: A Study at State Universities in Sri Lanka. *Sustainability* 2021, 13, 11749
23. Hollister, B., Nair, P., Hill-Lindsay, S., and Chukoskie, L. (2022). Engagement in online learning: student attitudes and behavior during COVID-19. *Front. Educ.*
24. Hsu, H.C., Wang, C.V., Levesque-Bristol, C., 2019. Reexamining the impact of selfdetermination theory on learning outcomes in the online learning environment. *Educat. Informat. Technol.* 24 (3), 2159–2174.
25. Kornpitack, P., & Sawmong, S. (2022). Empirical analysis of factors influencing student satisfaction with online learning systems during the COVID-19 pandemic in Thailand. *Heliyon*, 8.
26. Martínez-Argüelles, M., & Batalla-Busquets, J. (2016). Perceived service quality and student loyalty in an online university. *The International Review of Research in Open and Distributed Learning*, 17(4).
27. Meng W, Yu L, Liu C, Pan N, Pang X and Zhu Y (2024) A systematic review of the effectiveness of online learning in higher education during the COVID-19 pandemic period.
28. Mok, K. H., Xiong, W., and Bin Aedy Rahman, H. N. (2021). COVID-19 pandemic's disruption on university teaching and learning and competence cultivation: student evaluation of online learning experiences in Hong Kong. *Int. J. Chinese Educ.* 10:221258682110070. doi: 10.1177/22125868211007011
29. Muthuprasad, T., Aiswarya, S., Aditya, K. S., and Jha, G. K. (2021). Students' perception and preference for online education in India during COVID-19 pandemic.
31. Naji, K.K., Du, X., Tarlochan, F., Ebead, U., Hasan, M.A., Al-Ali, A.K., 2020. Engineering students' readiness to transition to emergency online learning in response to COVID- 19: case of Qatar. *Eurasia J. Math. Sci. Technol. Educ.* 16 (10).
32. Rahman, A. (2021). Using students' experience to derive effectiveness of COVID-19-lockdown-induced emergency online learning at undergraduate level: evidence from Assam. India. *Higher Education for the Future* 8, 71–89.
33. Rahman, A. (2021). Using students' experience to derive effectiveness of COVID-19-lockdown-induced emergency online learning at undergraduate level: evidence from Assam. India. *Higher Education for the Future* 8, 71–89.
34. Sang, S. (2023). Students' Online Learning Satisfaction, Self-efficacy and Academic Performance. *Lecture Notes in Education Psychology and Public Media*
35. Shaid, N. A., Kamruzaman, F. M., & Sulaiman, N. A. (2021). Online learning during on going COVID- 19 pandemic: A survey of students' satisfaction. *International Journal of Academic Research in Business and Social Sciences*, 11(7).

36. Sharma, K., Deo, G., Timalisina, S., Joshi, A., Shrestha, N., and Neupane, H. C. (2020). Online learning in the face of COVID-19 pandemic: assessment of students' satisfaction at Chitwan medical college of Nepal. *Kathmandu Univ. Med. J.* 18, 40–47.
37. Sharma, K., Deo, G., Timalisina, S., Joshi, A., Shrestha, N., and Neupane, H. C. (2020). Online learning in the face of COVID-19 pandemic: assessment of students' satisfaction at Chitwan medical college of Nepal. *Kathmandu Univ. Med. J.* 18, 40–47. doi: 10.3126/kumj.v18i2.32943
38. Singh, S. P., Malik, S., & Singh, P. (2016). Factors affecting academic performance of students. *Paripex Indian Journal of Research*, 5(4), 176–178.
39. Sri, P., Suci Ningsih, M., Santosa, H., Putu, I., Kusuma, I.P., & Info, A. (2023). EFL High School Students' Satisfaction in Online Learning and Expectations Towards Blended Learning: An Investigation. *Elsya : Journal of English Language Studies*.
40. Sri, P., Suci Ningsih, M., Santosa, H., Putu, I., Kusuma, I.P., & Info, A. (2023). EFL High School Students' Satisfaction in Online Learning and Expectations Towards Blended Learning: An Investigation. *Elsya : Journal of English Language Studies*.
41. Tsang, J. T., So, M. K., Chong, A. C., Lam, B. S., and Chu, A. M. (2021). Higher education during the pandemic: the predictive factors of learning effectiveness in COVID-19 online learning. *Educ. Sci.* 11:446.
42. Tsang, J. T., So, M. K., Chong, A. C., Lam, B. S., and Chu, A. M. (2021). Higher education during the pandemic: the predictive factors of learning effectiveness in COVID-19 online learning. *Educ. Sci.* 11:446.
43. Wang, C., Horby, P.W., Hayden, F.G., Gao, G.F., 2020. A novel coronavirus outbreak of global health concern. *Lancet* 395, 470–473.
44. Wong, J., Baars, M., Davis, D., Van Der Zee, T., Houben, G. J., and Paas, F. (2019). Supporting selfregulated learning in online learning environments and MOOCs: a systematic review. *Int. J. Human– Computer Interaction* 35, 356–373.
45. YaoJ.RaoJ.JiangT.XiongC. (2020). What Role Should Teachers Play in Online Teaching during the COVID-19 Pandemic? Evidence from China. *Sci Insight Edu Front*, 5(2), 517-524
46. Zeqiri, J., Kareva, V., Alija, S. (2021), “Blended Learning and Student Satisfaction: The Moderating Effect of Student Performance”, Vol. 12, No. 2, pp. 79-94.
47. Zhang, Y., and Chen, X. (2023). Students' perceptions of online learning in the post-COVID era: a focused case from the universities of applied sciences in China. *Sustain. For.* 15:946.
48. Zolotov, Y., Reznik, A., Bender, S., Isralowitz, R., 2020. COVID-19 fear, mental health, and substance use among Israeli university students. *Int. J. Ment. Health Addiction* 6, 1–8