



INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN PROGRESSIVE EDUCATION & DEVELOPMENT



www.hrmars.com
ISSN: 2226-6348

Preliminary Investigation of Undergraduate Learner's Satisfaction towards Hybrid Learning

Emma Nuraihan Mior Ibrahim, Arash Aiman Suhaimi

To Link this Article: <http://dx.doi.org/10.6007/IJARPED/v11-i3/15496>

DOI:10.6007/IJARPED/v11-i3/15496

Received: 14 July 2022, **Revised:** 18 August 2022, **Accepted:** 30 August 2022

Published Online: 23 September 2022

In-Text Citation: (Ibrahim & Suhaimi, 2022)

To Cite this Article: Ibrahim, E. N. M., & Suhaimi, A. A. (2022). Preliminary Investigation of Undergraduate Learner's Satisfaction towards Hybrid Learning. *International Journal of Academic Research in Progressive Education and Development*, 11(3), 1727–1739.

Copyright: © 2022 The Author(s)

Published by Human Resource Management Academic Research Society (www.hrmars.com)

This article is published under the Creative Commons Attribution (CC BY 4.0) license. Anyone may reproduce, distribute, translate and create derivative works of this article (for both commercial and non-commercial purposes), subject to full attribution to the original publication and authors. The full terms of this license may be seen at: <http://creativecommons.org/licences/by/4.0/legalcode>

Vol. 11(3) 2022, Pg. 1727 - 1739

<http://hrmars.com/index.php/pages/detail/IJARPED>

JOURNAL HOMEPAGE

Full Terms & Conditions of access and use can be found at
<http://hrmars.com/index.php/pages/detail/publication-ethics>



INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN PROGRESSIVE EDUCATION & DEVELOPMENT



www.hrmars.com

ISSN: 2226-6348

Preliminary Investigation of Undergraduate Learner's Satisfaction towards Hybrid Learning

Emma Nuraihan Mior Ibrahim, Arash Aiman Suhaimi

Faculty of Computer and Mathematical Sciences, Universiti Teknologi MARA, 40450, Shah
Alam, Selangor, Malaysia.

Corresponding Author's Email: emmanuraihan@uitm.edu.my

Abstract

The spread of Covid19 has forced global education institutions to switch to e-learning despite its challenges. At Universiti Teknologi MARA (UiTM) Shah Alam Malaysia, the undergraduate students are exposed to hybrid learning, which is a combination of both traditional classroom and online learning. For this study, we aimed to evaluate the undergraduate learning satisfaction which will measure the learner's attitude towards hybrid learning experiences. The research aimed to identify the relationship between factors affecting learner satisfaction among 70 UiTM Shah Alam computing undergraduate students about hybrid learning and further identify the effect of gender differences on learner satisfaction. Two factors were measured which are the hybrid learning process and the organization of the hybrid learning delivery system. The data was collected among the undergraduate students who had two semesters of experience with hybrid learning and a correlation coefficient test was performed. The results indicated positive hybrid learning experiences among undergraduate students and male students are highly satisfied with a hybrid learning experience. Future work indicated evaluating a larger sampling from various faculties for more holistic perspectives. In addition, future studies could also investigate the educator's perspective on the hybrid teaching and learning processes for better future implementation.

Keywords: Learner's Satisfaction, Hybrid Learning, Undergraduate Students, Online Learning

Introduction

With the COVID-19 situation, global institutions were prompted to take emergence action to adopt e-learning approach towards teaching and learning. The subsequent post-pandemic effect was to have hybrid learning by combining traditional classroom as well as e-learning approaches to minimizes the risk of spreading the viruses. In definition, hybrid learning or known as blended learning are the combined mode of face-to-face learning and online learning (Broadbent, 2017; Li, 2019). Such integration can perform and subsequently provides benefits afforded by the traditional way of learning to deliver the subject context holistically. As far as the movement control order (MCO) is concern, most of the universities has driven on an equal approach to produce a general alternative of distance education via blended/hybrid and online learning (Basuony, 2020; Neuwirth & Mukherji, 2021). In this case, Universiti Teknologi MARA (UiTM) Shah Alam Malaysia has adopted a full fledge of this method for the continuity of teaching and learning deliverables. The university utilises all

possible tools including virtual conferencing such as Zoom and Google Meet or in house learning management system platform (LMS) called UFuture (<https://ufuture.uitm.edu.my/home/>) as well as other platform like MS Teams, Edmodo and Google Classroom.

What makes the blended learning particularly effective is its ability to facilitate an inquiry, open communication, dialogue, critical debate face to face in class while merging with some reflective elements using asynchronous Internet discussion forum (Francescucci and Rohani, 2019). Nevertheless, it is still unknown, how the students are adapting to this new form of hybrid learning approach particularly towards the computing undergraduate students as they learned technical subjects such as programming languages which requires lab, tools and assisted tutorial sessions. Thus, with the multiple choices of LMS, instructors design courses with their preferred LMSs in various formats. Student's satisfaction would impact the general evaluation of their experiences upon using the LMS and how it effects their learning process (Neuwirth and Mukherji, 2021; Basuony, 2020; Yekefallah, 2021). A higher rate of student's satisfaction usually increases the benefits provided by the LMS which in turn positively influences student engagement, performance and retention (Stubb et al., 2011; Almarashdeh, 2016; Haddad, 2018). Previous study also investigates the characteristics, benefits, drawbacks and features that impact e-learning has been presented in (Ms and Toro, 2013) as well as how behaviours and cultural background does impact student education in the e-learning domain (Radha et. al., 2020). Therefore, the research objectives for this study are:

- To investigate the relationship between factors affecting learners' satisfaction among the computing undergraduate students.
- To identify the effect of gender differences towards the learner's satisfaction among the computing undergraduate students.

Literature Review

As education institutions navigate the era Covid19 and beyond, blended, hybrid or flipped learning models as the terms interchangeably used in the literature continues to overcome the traditional classroom system by providing new conceptualisation of class time. It gives a new leap to student as well as the educators to opt for whichever learning curve they endeavour be it virtual or face-to-face class. Hybrid learning means "learning environment that combines face-to-face instruction with technology-mediated instruction" (Graham and Dziuban 2008; Graham et. al., 2014) or a blend of face-to-face and online instruction. This means, the technology is integrated or mediated in the class course (e.g. watching lecture videos, collaborative activities) to replace the class seat time physically to foster learning process. This type of virtual learning allows student's flexibility in terms of time, class scheduling particularly for remote students as well as saving space in terms of classroom infrastructure. Previous research has shown, significant increases of student's performance such as improved learning and knowledge when compared to traditional classroom by using blended learning across subjects (Baepler et. al., 2014; He et al., 2016; Bowen et al., 2014; Joyce et al., 2014).

For hybrid learning to stay impactful for the learners, students must have positive experiences regardless of the digital tools or learning management system (LMS) platform used in the learning process. The higher satisfaction usually associated with the benefits provided by

these various digital approaches to elevate the student's overall experiences (Almarashdeh, 2016; Haddad, 2018). In this research, we defined satisfaction as a measurable element that represent a consideration or decision that provides a level of consumption against a particular feature of a product and service itself (Parahoo et al., 2015). Learning satisfaction represents affective responses of the learners such as feelings and attitudes, perceived level of fulfilment, desirability to learn resulting from the learning process (She et. al., 2021). Studies have shown student satisfaction is pivotal for the success or failure of an online education (Gopal et. al., 2021; Rabin et. al., 2019) which in turn interprets the quality of the course delivery (Hew et. al., 2020).

In the literature, there are numerous factors and determinants found by researchers to gauge learner's satisfaction towards e-learning such as perceived usefulness, ease of use of online platform, computer and academic self-efficacy (Almarashdeh, 2016; Jiang et. al., 2021), online support service quality (Ghazal et. al., 2017), student's engagement, course structure, interaction, teacher awareness (Baber, 2020), prior experience and online learning acceptance (Jiang et. al., 2021). Among the numerous factors, the element of online learning interaction is seen the most significant component to ensure the effectiveness of online learning delivery and is supported by the theory of transactional distance (Benson and Samarawickrema, 2009).

In addition, there were also research on how gender-based influence learner's satisfaction towards hybrid learning effectiveness (Gulnaz et. al., 2020). Hyde et. al (2019) discussed the differences between men and women in behaviour and personality is based on social construction where various sets of expectations and norms are associated with the two genders respectively. In the context of hybrid learning, significant gender differences may be identified through the deferred perception on their self-emotion and perceived effectiveness when conducting course-related work (Li et al., 2021). For example, it is found, female student's computer efficacy is much lower than the male counterparts (Gebhardt et al., 2019). Hence, evaluating the difference between gender and its role in education technology environment is important to understand the different types of engagement, motivation and self-regulation required for hybrid learning to be successful. Thus, the understanding of learner's satisfaction is important for educators and policymakers on how to plan an effective and efficient course structure involving hybrid learning in the future. This is no exception for UiTM as a whole. For this research, the researcher will measure the learner's satisfaction of hybrid learning among the computing undergraduate students due to their subject nature that requires lab session for technical computing subjects. The research is pertinent as the feedback from the learner's satisfaction study will determine future course deliverables.

Methodology

Research Instrument - Learner's Satisfaction Survey Questionnaire for Hybrid Learning

The learner's satisfaction survey set of questionnaires were adapted and modified from Sarkar et. al. (2021) which has been empirically validated (refer to Figure 1). The questionnaire examined two different categories which are learner's learning process (question 1, 2, 3, 4, 8 and 12) and organisation of hybrid learning delivery system (question 5, 6, 7, 9, 10 and 11). The questionnaire is measured through 5-points Likert scales (Strongly Agree, Agree, Neutral, Disagree and Strongly Disagree).

No.	Question
1	I prefer Hybrid Learning (HL) over traditional learning.
2	HL approach enhanced my self-directed learning ability
3	HL is an effective motivative learning process
4	HL promotes thinking and practice ability
5	HL sessions are well organised
6	Lecturers provided sufficient opportunities for discussion
7	Pre-lecture presentations helped in understanding a topic better
8	My attention and engagement in class was enhanced by HL
9	Fairly adequate time was available for the Pre-lecture online materials
10	Softcopy handouts of topic were concise, relevant and helped in understanding
11	Formative assessments motivated us to complete the topics in the module
12	I felt confident to answer questions in the HL session

Figure 1. Learner's satisfaction survey questionnaire

In addition, based on literature synthesizes we proposed two hypotheses on how gender differences affect learner's satisfaction as below:

H1: Male students are highly satisfied towards the hybrid learning in terms of Learning Process compared to female student.

H2: Male students are highly satisfied towards the hybrid learning in terms of the Organisation of Hybrid Learning Delivery System compared to female student.

Data Collection and Sampling

The data was collected through a Google form survey whereby the researcher post the announcement to respective chosen classes. The data collection process involved 66 undergraduate computing students resides in UiTM Shah Alam Selangor campus who are in Semester 5 because they are the pioneer group who had experience 14 weeks of lectures and tutorials in hybrid learning environment. The students were given 3 weeks to answer the survey. However, only 61 (n= 61) completed questionnaires were received by end of the duration.

Data Analysis

Descriptive analysis is used to analyse the demographic profiles of the respondents and measuring the learner's satisfaction questionnaires based on the Likert related to learning process and organization of hybrid learning delivery system whereas inferential analysis such as Wilcoxon Signed Rank and Spearman's Rank Correlation Coefficient Tests is used to examine the gender-based satisfaction towards hybrid learning approach.

Validity and Reliability

The reliability of the distributed questionnaire for this research was tested using reliability test through the calculation of Cronbach's Alpha. There are two variables of questionnaire that were distributed where the first variable is the Learning Process of Hybrid Learning (LP) and second variable is the Organisation of Hybrid Learning delivery system (OHL). A pilot study was conducted with 10 students and the results showed the corresponding value of Cronbach's Alpha of 0.874 for LP and 0.794 for OHL. As the α value is greater than 0.8 and less than 0.9 for LP variable, it is deemed to be said that the reliability of questionnaire shows a

good reliability level. As the α value is greater than 0.7 and less than 0.8 for OHL variable, it is deemed to be said that the reliability of questionnaire shows an acceptable reliability level.

Results and Discussions

-source LMSs are

generally free of charge and customisable based on the user preferences at a low cost (Bansode and Kumbhar, 2012, p. 415). Al-Ajlan (2012, p. 193) outlined a list of features of an LMS, which may be considered as components of an LMS, as shown in Table 1. We would expect different features (components) of an LMS which impacts students' perceptions when evaluating their UX of an LMS.

Demographic Profiles

Based on the Figure 2 (below), the gender distribution is slightly differed between male and female respondents. A total number of 61 (N=61) respondents were collected at the end of the study. Majority of the respondents are female with a total of 31 out of 61 respondents, with a percentage of 50.8% out of the whole respondents' population. The remaining 30 respondents are male with a total of 49.2% out of the whole respondents' population.

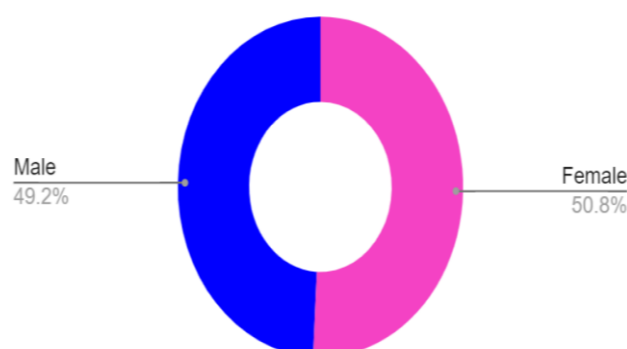


Figure 2. Respondent gender distributions.

Analysis on Satisfaction Towards Learning Process

Based on Table 1. it shows the analysis of the respondent satisfaction towards the learning process. There was a total of 6 statements that reflects the learner's satisfaction towards the learning process. 5-point Likert scale from strongly agree to strongly disagree were used in examining the level of satisfaction among the students. A middle category of "neutral" were also included.

Based on the questionnaire towards the satisfaction in learning process, the results indicated 45.9% of the respondents agreed that they prefer hybrid learning over traditional learning. Similarly, 45.9% of respondents agreed that hybrid learning approach enhanced their self-directed learning ability. 42.62% of the respondents agreed that their attention and engagement in class was enhanced by hybrid learning. However, 49.18% of the respondents responded "neutral" referring to the hybrid learning effectiveness and motivation to their learning process. We assumed the respondents are uncertain about providing direct answers based on their experience with hybrid learning session.

Table 1

Descriptive Analysis of Satisfaction Towards Learning Process

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I prefer hybrid learning over traditional learning.	16 26.22%	28 45.90%	13 21.31%	3 4.91%	1 1.66%
Hybrid learning approach enhanced my self-directed learning ability.	11 18.03%	28 45.90%	19 31.14%	3 4.91%	0
Hybrid learning is an effective and motivative learning process.	8 13.11%	22 36.06%	30 49.18%	1 1.66%	0
Hybrid learning promotes thinking and practice ability.	8 13.11%	25 40.98%	26 42.62%	2 3.28%	0
My attention and engagement in class was enhanced by hybrid learning.	11 18.03%	26 42.62%	20 32.78%	4 6.56%	0
I felt confident to answer questions in the hybrid learning session.	11 18.03%	17 27.87%	28 45.90%	4 6.56%	1 1.66%

Based on Table 2. it shows the respondent satisfaction towards the variable of organisation of hybrid learning delivery system. There was a total of 6 statements that reflects the learner's satisfaction towards the organisation of hybrid learning delivery system. 5- point Likert scale from strongly agree to strongly disagree were used in examining the level of satisfaction among the students. A middle category of "neutral" were also included. Based on the questionnaire towards the satisfaction in organisation of hybrid learning delivery system, the results indicated 47.54% respondents agreed that hybrid learning session are well organised. Similarly, 47.54% respondents also agreed that lecturers provided sufficient opportunities for discussion. A majority with 50.81% respondents agreed that pre- lecture presentation helped in understanding a topic better. Whereas 45.90% of the respondents strongly agreed that adequate time was available for the pre-lecture online materials. In addition, 47.54% of the respondents strongly agreed that softcopy handouts of topic were concise, relevant and help them in understanding. Lastly, 45.90% of the respondents strongly agreed that formative assessment motivated them to complete the topics in the module.

Table 2

Descriptive Analysis of Satisfaction Towards Organization of Hybrid Learning Delivery System

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Hybrid learning sessions are well organized.	18 29.51%	29 47.54%	11 18.03%	3 4.91%	0
Lecturers provided sufficient opportunities for discussion.	28 45.90%	29 47.54%	3 4.91%	1 1.66%	0
Pre-lecture presentations helped in understanding a topic better.	24 39.34%	31 50.81%	5 8.20%	1 1.66%	0
Fairly adequate time was available for the pre-lectureonline materials.	28 45.90%	27 44.26%	6 9.84%	0	0
Softcopy handouts of topic were concise, relevant and helped in Understanding.	29 47.54%	28 45.90%	4 6.56%	0	0
Formative assessments motivated us to complete the topics in the module	28 45.90%	27 44.26%	5 8.20%	1 1.66%	0

*Hypothesis Testing**Wilcoxon Signed Rank Test*

Based on the study, we wanted to know if there is a significant difference between the ratings of the male and female based on their experience in answering the survey questionnaire. Wilcoxon signed rank test is used since we are comparing two groups in the sample. We measured two groups sample to assess whether the ratings of the male and female mean ranks differ.

For this study, there are two variables of questionnaire that were categorised first as the Learning Process of Hybrid Learning (LP) and second variable is the Organisation of Hybrid Learning delivery system (OHL). The Wilcoxon test (for males and females) ranks the absolute values of the differences between the paired observations in the two groups of students and calculates a statistic on the number of negative and positive difference

To compare two independent samples based on the male and female responses, a Wilcoxon Signed Ranks Test is carried out. Figure 3. shows the responses received from the distribution of questionnaire items which focuses on male respondents. For negative ranks, there are 3 samples that fulfils condition that organization of hybrid learning delivery system (OHL) is lesser than learning process (LP). While for positive ranks, there are 17 samples that fulfils the condition of OHL is greater than LP and lastly there are 11 samples that are tied where OHL is

equal to LP. The highest number of ranks comes from positive ranks (OHL > LP). The p-value of the test is 0.002 and it is considered significant as the value is less than 0.05.

		Ranks		
		N	Mean Rank	Sum of Ranks
OHL - LP	Negative Ranks	3 ^a	10.00	30.00
	Positive Ranks	17 ^b	10.59	180.00
	Ties	11 ^c		
	Total	31		

a. OHL < LP
b. OHL > LP
c. OHL = LP

Test Statistics ^a	
	OHL - LP
Z	-3.128 ^b
Asymp. Sig. (2-tailed)	.002

a. Wilcoxon Signed Ranks Test
b. Based on negative ranks.

Figure 3. Wilcoxon Signed Ranks Test on Male Respondents

In addition, Figure 4. shows the Wilcoxon Signed Ranks Test carried out for the responses received from the distribution of questionnaire items which focuses on female respondents. For negative ranks, there are 3 samples that fulfils condition that OHL is lesser than LP. While for positive ranks, there are 16 samples that fulfils the condition of OHL is greater than LP and lastly there are 12 samples that are tied where OHL is equal to LP. The highest number of ranks comes from positive ranks (OHL > LP). The p-value of the test is 0.003 and it is considered significant as the value is less than 0.05.

		Ranks		
		N	Mean Rank	Sum of Ranks
OHL - LP	Negative Ranks	3 ^a	9.00	27.00
	Positive Ranks	16 ^b	10.19	163.00
	Ties	12 ^c		
	Total	31		

a. OHL < LP
b. OHL > LP
c. OHL = LP

Test Statistics ^a	
	OHL - LP
Z	-2.995 ^b
Asymp. Sig. (2-tailed)	.003

a. Wilcoxon Signed Ranks Test
b. Based on negative ranks.

Figure 4. Wilcoxon Signed Ranks Test on Female Respondents

Spearman Rank Correlation Coefficient Test

For this study, Spearman rank correlation is used to measure two hypotheses (1) the male students are highly satisfied towards the hybrid learning in terms of learning process compared to female students and (2) the male students are highly satisfied towards the hybrid learning in terms of the organisation of hybrid learning delivery system compared to female students.

Spearman's rho	LP	Correlation Coefficient	1.000	.545**
		Sig. (2-tailed)	.	.002
		N	31	31
	OHL	Correlation Coefficient	.545**	1.000
		Sig. (2-tailed)	.002	.
		N	31	31

Figure 5. Spearman's Rank Correlation Coefficient Test on Male Respondents

Figure 5. shows the Spearman's Rank Correlation Coefficient Test on male respondents. A significant value of less than 0.05 ($p < 0.05$) will indicate that there is a significant correlation between the variables. For this test, a significant value of 0.002 was obtained. For correlation coefficient between LP and OHL, it shows a positive direction of 0.545 which shows a moderate strength.

Spearman's rho	LP	Correlation Coefficient	1.000	.520**
		Sig. (2-tailed)	.	.003
		N	31	31
	OHL	Correlation Coefficient	.520**	1.000
		Sig. (2-tailed)	.003	.
		N	31	31

Figure 6. Spearman's Rank Correlation Coefficient Test on Female Respondents

Figure 6. shows the Spearman's Rank Correlation Coefficient Test on female respondents. A significant value of less than 0.05 ($p < 0.05$) will indicate that there is a significant correlation between the variables. For this test, a significant value of 0.003 was obtained. For correlation coefficient between LP and OHL, it shows a positive direction of 0.520 which shows a moderate strength.

Therefore, it can be summarised that for hypothesis 1, the male students are highly satisfied towards the hybrid learning in terms of learning process compared to female students. Based on the test that had been conducted, male respondents show a p-value = 0.002. This indicates that learning process is highly significant among male students. Thus, this hypothesis is accepted. In addition, for hypothesis 2, the male students are highly satisfied towards the hybrid learning in terms of the organisation of hybrid learning delivery system compared to female students. Based on the tests that had been conducted, male respondents show a p-value = 0.002. This indicates that organisation of hybrid learning delivery system is highly significant among male students. Thus, this hypothesis is accepted.

Conclusion

In summary, the first objective of this study is to identify the relationship between factors affecting learners' satisfaction towards the hybrid learning implementation among UiTM Shah Alam undergraduate students. With Spearman's Rank Correlation Coefficient Test, both variable shows a positive direction correlation with a moderate strength 0.545 and 0.520 for male and female respectively. This indication shows that as learning process (LP) increases, organisation of hybrid learning delivery system (OHL) will also increase. However, while the

result shows a positive direction, the variables do not indicate a strong or monotonic correlation. Thus, this prompt us that learning process and organisation of hybrid learning delivery system should be improved to increase learners' satisfaction.

In addition, the second objective of this study is to identify the effect of gender differences towards the learner's satisfaction among UiTM Shah Alam undergraduate students. From the two variables which are the learning process (LP) and organisation of hybrid learning delivery system (OHL); based on the test it shows that the male respondents have a p-value of 0.002 compared to female with a p-value of 0.003. This indicate that male respondents are highly satisfied compared to female respondents thus gender differences do affect the learner's satisfaction. This result is supported by the work from Li (2019), where the researcher has found that there is a different level of confidence between males and females that will affect their satisfaction towards learning environment. Nevertheless, the limitation of this study are the results does not represent the perspectives of overall undergraduate students at UiTM. Hence, for future work, we hope to engage with a larger sampling population from the educators and both undergraduate and post-graduate students. This is to have a better overview of their hybrid learning and teaching experiences. With the data it can provide insights for the university management and the instructors to improve its learning facilities and method of delivery.

References

- Almarashdeh, I. (2016). Sharing instructors experience of learning management system: A technology perspective of user satisfaction in distance learning course. *Computers in Human Behavior*, 63, 249-255.
- Baber, H. (2020). Determinants of students' perceived learning outcome and satisfaction in online learning during the pandemic of COVID-19. *J. Educ. E-Learn. Res.* 7, 285–292. doi: 10.20448/journal.509.2020.73.285.292
- Basuony, M. A., EmadEldeen, R., Farghaly, M., El-Bassiouny, N., and Mohamed, E. K. (2020). The factors affecting student satisfaction with online education during the COVID-19 pandemic: an empirical study of an emerging Muslim country. *Journal of Islamic Marketing*.
- Benson, R., and Samarawickrema, G. (2009). Addressing the context of e-learning: using transactional distance theory to inform design. *Distance Educ.* 30, 5–21. doi: 10.1080/01587910902845972
- Broadbent, J. (2017). Comparing online and blended learner's self-regulated learning strategies and academic performance. *The Internet and Higher Education*, 33, 24-32.
- Francescucci, A., and Rohani, L. (2019). Exclusively synchronous online (VIRI) learning: The impact on student performance and engagement outcomes. *Journal of marketing Education*, 41(1), 60-69. <https://doi.org/10.1177/0273475318818864>
- Gebhardt, E., Thomson, S., Ainley, J., and Hillman, K. (2019). Introduction to gender differences in computer and information literacy. *Gender differences in computer and information literacy*, 1-12.
- Ghazal, S., Aldowah, H., and Umar, I. (2017). Critical factors to learning management system acceptance and satisfaction in a blended learning environment. In *International Conference of Reliable Information and Communication Technology* (pp. 688-698). Springer.

- Gopal, R., Singh, V., and Aggarwal, A. (2021). Impact of online classes on the satisfaction and performance of students during the pandemic period of COVID 19. *Educ. Inf. Technol.*, 1–25. doi: 10.1007/s10639-021-10523-1
- Gulnaz, F., Althomali, A. D. A., and Alzeer, D. H. (2020). An investigation of the perceptions and experiences of the EFL teachers and learners about the effectiveness of blended learning at Taif University. *International Journal of English Linguistics*, 10(1), 329–344. <https://doi.org/10.5539/ijel.v10n1p329>
- Haddad, F. S. (2018). Examining the effect of learning management system quality and perceived usefulness on student's satisfaction. *Journal of Theoretical and Applied Information Technology*, 96(23).
- Hew, K. F., Hu, X., Qiao, C., and Tang, Y. (2020). What predicts student satisfaction with MOOCs: A gradient boosting trees supervised machine learning and sentiment analysis approach. *Computer Educ.* 145:103724. doi: 10.1016/j.compedu.2019.103724
- Jiang, H., Islam, A. Y. M. A., Gu, X., and Spector, J. M. (2021). Online learning satisfaction in higher education during the COVID-19 pandemic: A regional comparison between eastern and Western Chinese universities. *Educ. Inf. Technol.*, 1–23. doi: 10.1007/s10639-021-10519-x
- Li, K. (2019). MOOC learners' demographics, self-regulated learning strategy, perceived learning, and satisfaction: A structural equation modelling approach. *Computers & Education*, 132, 16-30
- Neuwirth, L. S., Jovic, S., & Mukherji, B. R. (2021). Reimagining higher education during and post-COVID-19: Challenges and opportunities. *Journal of Adult and Continuing Education*, 27(2), 141–156. <https://doi.org/10.1177/1477971420947738>
- Ma, L., and Lee, C. S. (2021). Evaluating the effectiveness of blended learning using the ARCS model. *Journal of Computer Assisted Learning*, 37(5), 1397-1408.
- Ms, P., and Toro, U. (2013). A review of literature on knowledge management using ICT. *Higher Education.*, 4(1), 62–67.
- Neuwirth, L. S., Jovic, S., and Mukherji, B. R. (2021). Reimagining higher education during and post-COVID-19: Challenges and opportunities. *Journal of Adult and Continuing Education*, 27(2), 141-156.
- Parahoo, Sanjai, Santally, M., Rajabalee, Yousra and Harvey, Heather. (2015). Designing a predictive model of student satisfaction in online learning. *Journal of Marketing for HIGHER EDUCATION*. 1-19. 10.1080/08841241.2015.1083511.
- Rabin, E., Kalman, Y. M., and Kalz, M. (2019). An empirical investigation of the antecedents of learner-centered outcome measures in MOOCs. *Int. J. Educ. Technol. High. Educ.* 16, 1–20. doi: 10.1186/s41239-019-0144-3
- Radha, R., Mahalakshmi, K., Sathish, V., and Saravanakumar, A. R. (2020). E-learning during lockdown of Covid-19 pandemic: A Global Perspective. *International Journal of Control and Automation*, 13(4), 1088–1099.
- She, L., Ma, L., Jan, A., Nia, S. H., and Rahmatpour, P. (2021). Online Learning Satisfaction During COVID-19 Pandemic Among Chinese University Students: The Serial Mediation Model. *Front Psychol.* 2021 Oct 5;12:743936. doi: 10.3389/fpsyg.2021.743936. PMID: 34675851; PMCID: PM8524086.
- Stubb, J., Pyhalto, K., and Lonka, K. (2011). Balancing between inspiration and exhaustion: PhD students' experienced sociopsychological well-being. *Studies in Continuing Education*, 33(1), 33-50. <http://dx.doi.org/10.1080/0158037X.2010.515572>

Yekefallah, L., Namdar, P., Panahi, R., and Dehghankar, L. (2021). Factors related to students' satisfaction with holding e-learning during the Covid-19 pandemic based on the dimensions of e-learning. *Heliyon*, 7(7), e07628.