

Online and Hybrid Learning Environment: Challenges and issues experienced by university students

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Abstract

Expanding educational settings to include online and hybrid modes requires discussing their challenges. This study explores the difficulties undergraduates encounter, including the impact on mental health concerns. These quantitative studies were distributed through a Google Form among 529 university students and analyzed using SPSS version 26. The survey reveals that individuals face multiple challenges, including anxiety and despair, while engaging in online and hybrid learning. It is recommended that suitable guidelines be formulated to mitigate the issues associated with online and hybrid learning for a better learning experience.

Keywords: Learning environment; Hybrid; Online; Mental Health

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1.0 Introduction

The Glossary of Educational Resources (2013) defines a learning environment as diverse physical locations, contexts, and cultures in which students learn. The word is frequently used as a more desirable or correct substitute for the more restrictive and traditional definition of classroom, which usually refers to a space with rows of desks and a chalkboard. It is undeniable that one key aspect of a conducive learning environment is the physical space. A well-designed classroom with adequate lighting, comfortable seating, and appropriate resources can enhance students' focus and productivity (Henderson & Dancy, 2007). In addition, physical space can promote student learning beyond students' abilities, as classrooms are thought to encourage student-centered learning and capitalize on students' choices and modern lifestyles. Hence, the design of these spaces is critical in developing a conducive environment for students, especially in online classes.

However, with the increase in the variety of classroom settings in education, including online and hybrid classrooms, discussion about issues and challenges with learning environments in these settings should be highlighted more. As the role of the educator has emerged to facilitate students' face-to-face learning in physical classrooms and via online platforms, studies focusing on students'

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perceptions and experiences regarding online classes will be essential for educators to conduct their learning sessions. As Nagler (2025) mentioned, educators act as experts in their subject and as role models and motivators for the students. An understanding of issues and challenges faced by students during online learning can help educators strategize a better approach toward a conducive online learning environment. This study focuses on the experience of higher education students during online learning. A quantitative method will investigate factors such as educators, assessment, peer collaboration and communications, home setting, and internet access during online learning. Findings and discussions will be provided to help higher education institutions redesign the learning environment with higher degrees of freedom for learners and practical learning.

2.0 Literature Review

2.1 Online and Hybrid Learning Environments

The shift toward online and hybrid learning has transformed higher education, offering new possibilities while posing significant challenges. According to Rumble (2001), the growth of distance education was influenced by postmodernist trends such as consumerism, the emergence of post-bureaucratic organizations, and globalization. These developments led to greater interest in using a range of e-learning tools in higher education, including e-books, simulations, text messaging, podcasting, wikis, and blogs. New tools keep being introduced to support more dynamic and varied learning experiences. Hodges et al. (2020) highlight the difference between emergency remote teaching (ERT) and well-designed online learning. The latter requires thoughtful instructional design and planning to help students learn effectively. Bao (2020) noted that ERT often lacks in-depth teaching methods because it is used in response to urgent needs rather than as part of a long-term plan. Haningsih and Rohmi (2022) found that students in hybrid learning models do better when courses include set times for interaction, such as live discussions, group projects, and self-paced learning. Mishra et al. (2020) emphasized the importance of digital equity, noting that differences in access to technology and infrastructure often exacerbate educational inequalities. These studies show that while online and hybrid learning have great potential, their success depends on sound design, sufficient resources, and strong institutional support.

2.2 Roles of Educators in Online and Hybrid Learning

The changing role of educators in online learning has been widely studied, focusing on how professional development affects teaching effectiveness. Van Nuland et al. (2020) stressed that training in digital pedagogy and instructional technology is essential for helping educators meet the demands of online teaching. Similarly, Martin et al. (2020) found that professional development programs focused on interactive tools, such as video conferencing platforms, collaborative software, and multimedia tools, increased student engagement and satisfaction. Singh, Singh, and Matthees (2022) suggested that combining social, cognitive, and teaching presence is vital to creating a strong, positive online learning experience. This framework supports the idea that instructors play a key role in encouraging active learning, fostering connection, and providing structured content. Cutri, Mena, and Whiting (2020) highlighted educators' added workload when adapting to digital teaching, noting that ongoing learning and access to peer support networks help reduce these challenges. Borup et al. (2020) noted that maintaining a strong instructor presence through consistent communication, personalized feedback, and active facilitation is associated with better student retention and outcomes. These studies show that professional development helps educators improve their digital skills and create more effective, student-centered online learning experiences.

2.3 Assessment in Online and Hybrid Learning

Assessing student learning in online settings has required new approaches to deal with the lack of face-to-face interaction. Kearns (2012) suggested breaking down larger tasks into smaller parts and giving continuous feedback to improve learning outcomes. Boud and Soler (2016) emphasized the need to shift toward formative assessments focusing on the learning process rather than just the final product, which aligns with real-world assessment methods. Mellar et al. (2018) also discussed the need for tools like proctoring software, plagiarism detectors, and open-book assessments to address concerns about cheating in online classes. Recent advances in adaptive learning technologies, as reported by Woolf et al. (2021), have shown promise in tailoring assessments to student progress, providing instant feedback, and identifying areas where students need help. Ng et al. (2020) explored gamified assessments, which increase student motivation and engagement by making evaluations feel like games. When implemented correctly, these strategies help ensure assessments are reliable and beneficial for learning in online settings.

2.4 Peer Learning in Online and Hybrid Learning

New research shows peer learning is important for encouraging teamwork and improving learning outcomes in online and hybrid environments. Bagley et al. (2021) found that asynchronous peer discussions offer flexibility and support teamwork, making them effective in hybrid settings. Mendieta-Aragón et al. (2023) showed that peer learning activities, such as group projects and peer feedback, help students learn more and improve their communication and motivation. Their study of peer learning in the asynchronous part of hybrid teaching found that students see these activities as helpful, which helps them better understand subjects and feel more connected in online classes. Cheng, Hampton, and Kumar (2024) said that working together on problems in online peer learning contexts greatly improves critical thinking and interpersonal skills. Tsay and Brady (2010) also noticed that structured peer learning reduces student competition, creating a more inclusive and supportive environment. These findings highlight the importance of well-organized and supported peer learning in helping students stay engaged and succeed in online and hybrid settings.

2.5 Physical Environment and Internet Accessibility

The physical environment and access to reliable internet significantly affect how well online learning works. Zhu, Zhu, and Zhao (2024) pointed out that poor home conditions, such as noisy or crowded spaces, make it hard for students to concentrate and stay engaged in online classes. Bao (2020) said students from less-resourced families face even more challenges, such as not having personal devices or enough internet speed. Sun et al. (2022) supported these findings, showing that these issues often lead to higher stress and lower academic performance. Mishra et al. (2020) reported that lending devices and offering cheaper internet plans are important for helping students. Wu (2023) suggested that creating designated study areas and providing resources can significantly improve focus and productivity. These studies show that addressing environmental and tech barriers is key to making online learning fair and effective.

2.6 Challenges and Opportunities in Online and Hybrid Learning

The rapid shift to online learning has brought challenges and opportunities for innovation in higher education. Cui et al. (2024) discussed the potential of gamification, augmented reality (AR), and artificial intelligence (AI) to increase engagement and make learning more personalized. However, long-term online learning has also caused issues such as digital fatigue and lower motivation, as noted by Huang and Wang (2023). As discussed by Ambok Welan & Zulkilfi (2023), a shift toward online and hybrid learning can lead to limited social interaction and increased academic pressure among students, increasing stress, anxiety, and emotional fatigue. While Chileya (2022) noticed that decreasing instructors' engagement with students probably makes students more anxious when facing technical difficulties during learning time, as well as lower motivation. Although hybrid learning offers flexibility, students may still experience confusion in managing both physical and virtual components, resulting in higher levels of cognitive overload and mental exhaustion (Losa-Iglesias et al., 2023). Handling these problems requires a comprehensive approach that supports student well-being, promotes regular interaction, and employs varied teaching strategies to keep students engaged. Van Der Spoel et al. (2020) suggested that combining live and self-paced activities gives students more flexibility and maintains chances for real-time interaction. Kessler et al. (2020) recommended using universal design in online courses to ensure they are accessible for students with disabilities, making these environments more inclusive overall.

3.0 Research Methodology

3.1 Sampling techniques

This study employed purposive sampling to recruit participants, as the research specifically targeted undergraduate students who had experienced at least one semester of online learning. Purposive sampling was considered appropriate because it ensured that only individuals with direct and relevant exposure to the phenomenon under investigation were included, thereby strengthening the validity of the data collected (Campbell et al., 2020). The sample consisted of 527 students across nine faculties at Universiti Malaysia Kelantan, which represents a sufficiently large number to enhance the reliability of the quantitative analysis and minimize sampling error. By focusing on students who met the defined criteria, the study generated findings that are both contextually meaningful and reflective of the actual challenges undergraduates face in online and hybrid learning environments.

3.2 Participant selection

The participants of this study were undergraduate students from Universiti Malaysia Kelantan, representing nine faculties across the university. All participants must have experienced at least one semester of online learning to ensure sufficient exposure to the context being studied. In total, 527 students were selected, making the sample large enough to provide reliable insights into the challenges of online and hybrid learning, and this selection process aligns with the quantitative survey design of the study (Hu, 2023).

Table 1. Respondents' Demographic Background

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	135	25.6
	Female	392	74.4
Age Group	18–20 years	210	39.8
	21–23 years	265	50.3
	24 years and above	52	9.9
Year of Study	Year 1	120	22.8
	Year 2	150	28.5
	Year 3	170	32.2
	Year 4	87	16.5
Mode of Learning Experience	Fully Online	310	58.8
	Hybrid (Online & Face-to-Face)	217	41.2
Total		527	100.0

Table 1 presents the demographic profile of the 527 undergraduate respondents. The sample consisted predominantly of female students (74.4%), with male students accounting for 25.6%. Most respondents were between the ages of 21 and 23 (50.3%), followed by those aged 18–20 (39.8%) and a smaller proportion aged 24 and above (9.9%). In terms of academic progression, the largest group was Year 3 students (32.2%), followed by Year 2 (28.5%), Year 1 (22.8%), and Year 4 (16.5%). Concerning their learning mode, most reported engaging primarily in fully online learning (58.8%), while the remaining 41.2% experienced hybrid (online and face-to-face)

arrangements. These demographic details provide a comprehensive picture of the respondents and indicate a balanced representation across faculties and study years, strengthening the findings' relevance to the broader undergraduate population (Wiese et al., 2010).

3.3 Data Collection

Data for this study were collected through a structured questionnaire distributed online using Google Forms to ensure accessibility and convenience for all participants. Respondents were informed of the study's purpose and provided consent before beginning the survey. On average, it took approximately 20 minutes to complete the questionnaire. The instrument employed a 5-point Likert scale ranging from "strongly disagree" to "strongly agree," allowing for measuring students' perceptions, attitudes, and experiences related to online and hybrid learning. Upon completion, responses were compiled and analyzed using the Statistical Package for the Social Sciences (SPSS) version 26. Reliability testing was conducted through Cronbach's alpha to assess the internal consistency of the items, ensuring that the constructs measured were coherent and dependable. This systematic process provided a robust foundation for examining the challenges faced by undergraduates in the online learning environment (Taber, 2018).

3.4 Rigor

To ensure methodological rigor in this quantitative study, several procedures were undertaken to establish the reliability and validity of the instrument. First, the questionnaire items were adapted and refined based on relevant literature and expert input from the field of social sciences to ensure strong content validity (Taherdoost, 2016). A pilot test was then conducted with a small group of students who met the study criteria, and their responses were analyzed to identify any ambiguities or weaknesses in the items (Fraser et al., 2018). Following the pilot, necessary revisions were made to improve clarity and alignment with the research objectives. Reliability was assessed using Cronbach's alpha to examine the internal consistency of the constructs, with values exceeding the recommended threshold of 0.70, indicating satisfactory reliability. In addition, construct validity was supported by expert review and item analysis, ensuring that the questionnaire accurately measured the intended domains. These steps collectively enhanced the credibility, accuracy, and consistency of the data collected for the main study.

4.0 Findings and Discussion

Table 2. Reliability Statistics

Cronbach's Alpha	N of Items
.923	7

The results in Table 2 indicate that the instrument achieved a Cronbach's alpha value of 0.923 for the seven items tested, which falls within the "excellent" range. This demonstrates that the items are highly consistent in measuring the intended construct, thereby providing confidence in the scale's reliability for further analysis in this study.

Table 3. Items of Survey

Item	Mean	Std. Deviation	N	Cronbach's Alpha
1. Online classes are causing me to feel stressed at the moment.	3.7826	1.17583	529	.903
2. The lecturer's attitude during the online classes makes me feel stressed.	4.0435	1.04809	529	.918
3. The stability level of the internet connection at home while attending lectures makes me feel stressed.	3.5558	1.26177		.920
4. The conditions and environment at home while attending online lectures make me feel stressed.	3.8204	1.17739	529	.911
5. I have been getting less rest or sleep while attending online classes.	3.7127	1.16963	529	.917
6. I feel a hefty burden while attending online classes.	3.8355	1.14208	529	.903
7. I feel that my physical and mental health has declined while attending online classes.	3.7694	1.19331	529	.907
8. Communication with other students online makes me feel stressed.	3.5614	1.23572	529	.826
9. Conflict among students occurs more frequently during online learning.	3.3837	1.26064	529	.830
10. Conflict with other students during online classes causes stress.	3.5898	1.21542	529	.820

Table 3 shows that the overall mean scores for most items fall within the high range, indicating that most respondents reported significant levels of stress and challenges associated with online and hybrid learning. In line with Najihah et al. (2018), a mean value above 3.66 suggests a high level of agreement with the statements, and this threshold is met for several critical items. Among all items, the lecturer's attitude during online classes (M = 4.04, SD = 1.05) recorded the highest mean, highlighting the crucial role of instructors in influencing students' emotional well-being. This finding validates the importance of educators not only as content deliverers but also

as facilitators of supportive and empathetic learning environments (Mardiana, 2020). The results are consistent with Razak et al. (2021), who emphasize the emotional dimension as a key determinant in students' adaptability to online learning.

On the other hand, the item with the lowest mean score was related to conflict among students ($M = 3.38$, $SD = 1.26$), suggesting that interpersonal conflict, while present, is a comparatively less significant challenge than other stressors. This indicates that students can generally manage peer interactions in online platforms, although occasional conflicts still occur. Nevertheless, effective peer communication remains important for maintaining a positive learning climate (Razak et al., 2022).

Item 3, concerning internet stability ($M = 3.56$, $SD = 1.26$), shows that connectivity issues were a moderate concern. Although internet access is often cited as a barrier in online learning (Ghafar et al., 2021), the current findings suggest that students were relatively more affected by psychosocial stressors, such as lecturer attitudes, home environment, and heavy workload, than technical limitations. This underscores the need for universities to address technological and emotional aspects of online learning readiness.

Furthermore, home conditions (Item 4, $M = 3.82$, $SD = 1.18$) were also reported as a significant source of stress. Students often faced distractions, limited privacy, or a lack of family support, all of which contributed to heightened anxiety. This finding supports Nusraningrum et al. (2022), who noted that students' domestic environments strongly influence their learning performance during online instruction.

Sleep and rest deprivation (Item 5, $M = 3.71$, $SD = 1.17$) emerged as another major issue, with students reporting reduced well-being and increased isolation. This concern reflects the observation that poorly designed online learning environments can contribute to feelings of hopelessness (Hershner & Chervin, 2014). Similarly, perceived workload and academic burden (Item 6, $M = 3.84$, $SD = 1.14$) further aggravated stress levels, suggesting the importance of balanced course design and workload distribution (Qureshi et al., 2022).

Finally, students reported that online classes negatively impacted both their physical and mental health (Item 7, $M = 3.77$, $SD = 1.19$). This result reinforces the call for higher education institutions to prioritize student well-being by integrating counseling services, stress management programs, and supportive instructor–student interactions into online learning structures. As Ahmad et al. (2022) have shown, anxiety and depression are common outcomes of prolonged online learning without adequate institutional support.

This study has potential limitations. As this research focused on students from only one university, further studies should include a larger number of respondents from a variety of universities in Malaysia. In addition, qualitative methods such as focus group discussions are advisable to gain greater depth into students' knowledge of mental health concerns.

5.0 Conclusion

The findings of this study demonstrate that the challenges associated with online and hybrid learning significantly impact the effectiveness of virtual education. Issues such as stress, workload, lecturer attitudes, and home environments collectively influence students' learning experiences and their overall well-being. These results highlight the importance of this research in informing the development of innovative learning concepts, including hyflex (hybrid and flexible) models, which aim to foster greater inclusivity and active participation in the educational process. Furthermore, the study underscores the critical role of engagement and collaboration between educators in addressing the difficulties faced by students. Higher education institutions must support lecturers adapting to new teaching approaches, including professional development, peer support, and self-training, to better respond to students' academic and emotional needs. For future research, it is recommended that psychosocial and institutional stakeholders collect more comprehensive data on the mental health challenges students face in online and hybrid settings. Such evidence will be invaluable in shaping policies and interventions that strengthen the effectiveness of online learning and safeguard student well-being and personal growth. As primary and secondary schools in Malaysia have already embarked on a hybrid class initiative, piloting since 2021, the national education policy should be introduced. In higher education, systematic guidance for instructors will be a significant support in welcoming a new generation experienced with online and hybrid learning. By doing so, educational systems can move toward a more sustainable and holistic approach to digital learning in higher education.

References

- Ahmad, N.S., Ismail, A., Husain, Z. (2022). Psychological well-being impacts among university students on online learning during the COVID-19 pandemic. *International Journal of Public Health Science*, 11(3), 1037-1045. <https://doi.org/10.11591/ijphs.v11i3.21413>
- Ambok Welan, Z. A., & Zulkifli, A. F. (2023). The impact of online learning on mental illness among physical and health education students at Malaysian public university. *Asian Journal of University Education*, 19(4). <https://doi.org/10.24191/ajue.v19i4.24625>
- Andrade C. (2021). The inconvenient truth about convenience and purposive samples. *Indian Journal of Psychological Medicine*, 43(1), 86–88. <https://doi.org/10.1177/0253717620977000>
- Bagley, P. L., Dalton, D. W., Eller, C. K., & Harp, N. L. (2021). Preparing students for the future of work: Lessons learned from telecommuting in public accounting. *Journal of Accounting Education*, 56, 100728. <https://doi.org/10.1016/j.jacedu.2021.100728>
- Bao, A. (2020). Online learning with a bonus. *American Society for Engineering Education*, 29(8), 41-41.
- Borup, J., Graham, C. R., West, R. E., Archambault, L., & Spring, K. J. (2020). Academic communities of engagement: An expansive lens for examining support structures in blended and online learning. *Educational Technology Research and Development*, 68, 807-832. <https://doi.org/10.1007/s11423-020-09744-x>

- Boud, D., & Soler, R. (2016). Sustainable assessment revisited. *Assessment & Evaluation in Higher Education*, 41(3), 400-413. <https://doi.org/10.1080/02602938.2015.1018133>
- Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., Bywaters, D., & Walker, K. (2020). Purposive sampling: Complex or simple? Research case examples. *Journal of Research in Nursing*, 25(8), 652-661. <https://doi.org/10.1177/1744987120927206>
- Cheng, L., Hampton, J., & Kumar, S. (2024). Engaging students via synchronous peer feedback in a technology-enhanced learning environment. *Journal of Research on Technology in Education*, 56(3), 347-371. <https://doi.org/10.1080/15391523.2022.2142874>
- Cui, X., Du, C., Shen, J., Zhang, S., & Xu, J. (2024). Impact of Gamified Learning Experience on Online Learning Effectiveness. *IEEE Transactions on Learning Technologies*, 17, 2130-2139. <https://doi.org/10.1109/TLT.2024.3462892>
- Cutri, R. M., Mena, J., & Whiting, E. F. (2020). Faculty readiness for online crisis teaching: transitioning to online teaching during the COVID-19 pandemic. *European Journal of Teacher Education*, 43(4), 523-541. <https://doi.org/10.1080/02619768.2020.1815702>
- Egan, K. (2002). *Getting it wrong from the beginning: Our progressivist inheritance from Herbert Spencer, John Dewey, and Jean Piaget*. New Haven, CT: Yale University Press.
- Fraser, J., Fahlman, D. (W.), Arscott, J., & Guillot, I. (2018). Pilot testing for feasibility in a study of student retention and attrition in online undergraduate programs. *International Review of Research in Open and Distributed Learning*, 19(1), 260-278. <https://doi.org/10.19173/irrodl.v19i1.3326>
- Ghfar, N. M. A., Jamal, N. F., & Hasan, N. I. A. (2021). Perceived stress among UiTM students during open and distance learning (ODL). *International Journal of Academic Research in Business and Social Sciences*, 11(8), 1780-1792. <http://dx.doi.org/10.6007/IJARBS/v11-i8/10893>
- Hair, J. F. J., Hult, G. T. M., Ringle, C. M. & Sarstedt, M. (2017). *A primer on partial least squares structural equation modeling (PLS-sem)* (2nd ed.). Thousands Oak, CA: Sage Publications.
- Haningsih, S., & Rohmi, P. (2022). The pattern of hybrid learning to maintain learning effectiveness at the higher education level post-COVID-19 pandemic. *European Journal of Educational Research*, 11(1), 243-257. <https://doi.org/10.12973/eu-jer.11.1.243>
- Hershner, S. D., & Chervin, R. D. (2014). Causes and consequences of sleepiness among college students. *Nature and Science of Sleep*, 6, 73-84. <https://doi.org/10.2147/NSS.S62907>
- Hodges, C. B., & Fowler, D. J. (2020). The covid-19 crisis and faculty members in higher education: from emergency remote teaching to better teaching through reflection. *International Journal of Multidisciplinary Perspectives in Higher Education*, 5(1), 118-122.
- Hu, G. Q. (2023). Qualitative analysis of students' online learning experiences after the university reopening. *Journal of Education, Humanities and Social Sciences*, 7, 115-134. <https://doi.org/10.54097/ehss.v7i.4074>
- Huang, Y., & Wang, S. (2023). How to motivate student engagement in emergency online learning? Evidence from the COVID-19 situation. *Higher Education*, 85(5), 1101-1123. <https://doi.org/10.1007/s10734-022-00880-2>
- Kearns, L. R. (2012). Student assessment in online learning: Challenges and effective practices. *Journal of Online Learning and Teaching*, 8(3), 198-208.
- Kessler, A., Barnes, S., Rajagopal, K., Rankin, J., Pouchak, L., Silis, M., & Esser, W. (2020). Saving a semester of learning: MIT's emergency transition to online instruction. *Information and Learning Sciences*, 121(7/8), 587-597. <https://doi.org/10.1108/ILS-04-2020-0097>
- Losa-Iglesias, M. E., Calvo-Lobo, C., Jiménez-Fernández, R., Rodríguez-Sanz, D., Corral-Liria, I., & Becerro-de-Bengoa-Vallejo, R. (2023). Comparison between virtual and hybrid education for psychological factors and academic stress in freshman nursing students: A case-control study. *BMC Nursing*, 22, 300. <https://doi.org/10.1186/s12912-023-01477-5>
- Mardiana, H. (2020). Lecturers' adaptability to technological change and its impact on the teaching process. *Jurnal Pendidikan Indonesia*, 9(2), 275-289. <http://dx.doi.org/10.23887/jpi-undiksha.v9i2.24595>
- Martin, J. K. (2021). Exploring EFL students' perceptions of the use of synchronous video conferencing to develop their speaking competence. *The Journal of Seigakuin University*, 33(1-2), 161-180.
- Mellar, H., Peytcheva-Forsyth, R., Kocdar, S., Karadeniz, A., & Yovkova, B. (2018). Addressing cheating in e-assessment using student authentication and authorship checking systems: teachers' perspectives. *International Journal for Educational Integrity*, 14(1), 1-21. <https://doi.org/10.1007/s40979-018-0025-x>
- Mendieta-Aragón, A., Arguedas-Sanz, R., Ruiz-Gómez, L. M., & Navío-Marco, J. (2023). Tackling the challenge of peer learning in hybrid and online universities. *Education and Information Technologies*, 28(4), 4505-4529. <https://doi.org/10.1007/s10639-022-11397-7>
- Mishra, D., Agarwal, N., Sharahiley, S., & Kandpal, V. (2024). Digital financial literacy and its impact on financial decision-making of women: Evidence from India. *Journal of Risk and Financial Management*, 17(10), 468-491. <https://doi.org/10.3390/jrfm17100468>
- Najihah, A.W., Hasan, H., Anas, M.Y., Fadzli, A., Omar, S.H.S. (2018). The importance of psychological and educational counseling from the students' perspective. *International Journal of Academic Research in Business and Social Sciences*, 8(4), 660-670. <https://doi.org/10.6007/ijarbs/v8-i4/4051>
- Ng, L. K., & Lo, C. K. (2022). Flipped classroom and gamification approach: Its impact on performance and academic commitment on sustainable learning in education. *Sustainability*, 14(9), 5428. <https://doi.org/10.3390/su14095428>
- Nusraningrum, D., Mekar, T. and Ahmad, F. (2022). The influence of studying from home, stress level, and ability to use technology toward learning achievement during the Covid-19 pandemic: A case study in Indonesia. *Proceedings of the 4th International Conference on Finance, Economics, Management and IT Business (FEMIB 2022)*. 57-64 <https://doi.org/10.5220/0010899200003206>

- Razak, A.A., Noor Hisham, M.N., Asma' Lailee, M.N., Burhan, C.D., & Marwan, I. (2021). Students' adaptability in online learning based on Malaysian students' perception. *Malim: Jurnal Pengajian Umum Asia Tenggara*, 22, 139-152. <https://doi.org/10.17576/malim-2021-2201-11>
- Razak, A.A., Azahah, A.H., Lukman, Z.M., Razak, A.A., Asma Lailee, M.N. (2022). Instrument measuring the adaptability of university students to online learning (SOLE) and its predicting factors. *International Journal of Learning, Teaching and Educational Research*, 21(3), 281-300. <https://doi.org/10.26803/ijlter.21.3.15>
- Rumble, G. (2001). Re-inventing distance education, 1971?2001. *International Journal of Lifelong Education*, 20(1-2), 31-43. <https://doi.org/10.1080/02601370010008246>
- Singh, J., Singh, L., & Matthees, B. (2022). Establishing social, cognitive, and teaching presence in online learning—A panacea in COVID-19 pandemic, post vaccine and post pandemic times. *Journal of Educational Technology Systems*, 51(1), 28-45. <https://doi.org/10.1177/00472395221095>
- Sun, H. L., Sun, T., Sha, F. Y., Gu, X. Y., Hou, X. R., Zhu, F. Y., & Fang, P. T. (2022). The influence of teacher–student interaction & on the effects of online learning: Based on a serial mediating model. *Frontiers in Psychology*, 13, 779217. <https://doi.org/10.3389/fpsyg.2022.779217>
- Taber, K. S. (2018). The use of Cronbach's alpha when developing and reporting research instruments in science education. *Research in Science Education*, 48, 1273–1296. <https://doi.org/10.1007/s11165-016-9602-2>
- Taherdoost, H. (2016). Validity and reliability of the research instrument: How to test the validation of a questionnaire/survey in a research. *SSRN Electronic Journal*, 5(3), 28–36. <https://doi.org/10.2139/ssrn.3205040>
- The Glossary of Educational Resources. Retrieved January 20, 2024, from <https://www.edglossary.org/learning-environment/>
- Tsay, M., & Brady, M. (2010). A case study of cooperative learning and communication pedagogy: Does working in teams make a difference?. *Journal of the Scholarship of Teaching and Learning*, 78-89. <https://scholarworks.iu.edu/journals/index.php/josotl/article/view/1747>
- van der Spoel, I., Noroozi, O., Schuurink, E., & van Ginkel, S. (2020). Teachers' online teaching expectations and experiences during the COVID19-pandemic in the Netherlands. *European Journal of Teacher Education*, 43(4), 623–638. <https://doi.org/10.1080/02619768.2020.1821185>
- Van Nuland, S., Dinitsa-Schmidt, S., Assunção Flores, M., Hordatt Gentles, C., la Velle, L., & Ruttenberg-Rozen, R. (2024). Changes in teacher education provision: Comparative experiences internationally. *Journal of Education for Teaching*, 50(2), 341-366. <https://doi.org/10.1080/02607476.2024.2334321>
- Wiese, M., van Heerden, C., & Jordaan, Y. (2010). The role of demographics in students' selection of higher education institutions. *Acta Commercii*, 10(1), 82–93. <https://doi.org/10.4102/ac.v10i1.124>
- Woolf, K., Harrison, D., & McManus, C. (2021). The attitudes, perceptions and experiences of medical school applicants following the closure of schools and cancellation of public examinations in 2020 due to the COVID-19 pandemic: a cross-sectional questionnaire study of UK medical applicants. *BMJ Open*, 11(3), e044753. <https://doi.org/10.1136/bmjopen-2020-044753>
- Wu, C. H. (2023). Going to Taiwan in Fraught Times: Affordability, Learning Productivity, and Positive Student Experiences. *Frontiers: The Interdisciplinary Journal of Study Abroad*, 35(3), 97-127. <https://doi.org/10.36366/frontiers.v35i3.799>
- Zhu, L., Zhu, Q., & Zhao, X. (2024). Identifying determinants of student learning effects in intensive online environments: An empirical investigation in civil engineering education. *International Journal of Construction Management*, 24(11), 1249-1258. <https://doi.org/10.1080/15623599.2022.2152949>