

Systematic Literature Review: An Immersive and Engaging Online Learning Environment in Higher Education through Innovative Pedagogies

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Abstract

In the 21st century, the way knowledge is organized, distributed, and learned has changed tremendously. These changes can strongly influence the teaching and learning processes in the classroom. In an era where organized knowledge is more than just a tree-like structure, the classic pedagogies are no longer effective or engaging enough for millennial learners. This study aims to identify suitable strategies based on innovative 21st century pedagogies that are relevant to promoting an immersive and engaging online learning environment for higher education students. To achieve this objective, a systematic literature review was executed. This paper elaborates on the rigorous systematic literature review process done on the 210 selected journal articles and papers on innovative pedagogies that contribute to an immersive and engaging online learning environment for higher education. The analysis reveals that even though different fields of study apply different innovative pedagogy strategies, most of them share similar themes in implementing the strategies during online learning. These are self-directed learning, autonomy, metacognition, active participation, peer collaboration, fluidity, and flexibility which are some of the elements advocated in 21st-century learning. These findings act as a heuristic device to propose suitable strategies to promote an immersive and engaging online learning environment for higher education students.

Keywords: Innovative Pedagogies, Higher Education, Immersive And Engaging Learning, Online Learning, Systematic Literature Review.

Introduction

Higher education learning environments have undergone continuous transformation. The swift shift to online delivery models in higher education has significantly transformed the

tertiary education landscape. Originally designed to complement face-to-face learning rather than replace it (Peschl, Deng, & Larson, 2021), an increasing number of tertiary courses are now offered entirely online, which has become a preferred option for many students (Karunanayaka, 2023; Portuguese Castro & Gómez Zermeño, 2020). These advancements have led to a stronger focus on 21st-century education within higher education curricula, driven by substantial changes in learning processes, particularly with the increased integration of technology and the adaptation to remote and hybrid learning models necessitated by the COVID-19 pandemic. Significant progress has been made in innovative teaching methods to maintain high levels of student engagement and performance. There is a noticeable shift from traditional pedagogy to andragogy, heutagogy, and peeragogy, which may enhance knowledge acquisition among students.

Well-designed online courses revolve around the learner and are considered learner-centered (Shand, Glassett Farrelly, & Costa, 2016). An increased use of online learning environments in higher education has been an emerging trend in the 21st century due to the ever-changing world of technology and the need to guide 21st century learners to approach learning, teaching, collaboration, and communication in fundamental ways. Thus, when learning technologies are introduced, attention is often paid to the technology implementation (Chen & 2016) rather than to promoting innovative pedagogies and learning objectives. It is obvious that the existing frameworks/models are not sensitive to dynamic learning and are lacking in two main components that are essential to 21st century education, which are: (1) the innovative pedagogy concept; and (2) the immersive learning concept.

Immersive learning fosters a realistic environment that fully engages participants in scenarios and contextualized activities, enabling them to approach learning from both theoretical and practical perspectives. This approach helps students develop the skills needed for the workplace. To achieve an immersive learning experience, innovative teaching methods must be implemented in online classrooms, enhancing student engagement and overall learning (Ab.Wahid, 2022; Storksdieck, 2016). With current online learning, current technologies have also developed so well to the extent that traditional classroom approaches fail to catch up. This can lead to a lack of engagement between students and educators during online learning. Hence, online learning strategies need to be revised to ensure an immersive and engaging learning environment can be delivered to students. As outlined in Framing Malaysian Higher Education 4.0: Future-Proof Talents, the need to focus on innovation in pedagogy is paramount due to (1) the belief that the human potential is unlimited, (2) the pedagogical approach that is aimed at mastering reality in the system, (3) the stimulation of nonlinear thinking, and (4) the mobile role-playing field of the teacher -- the teacher simultaneously teaches and learns from the student. Figure 1 shows the framework of Framing Malaysian Higher Education 4.0: Future-Proof Talents (MOHE, 2018).

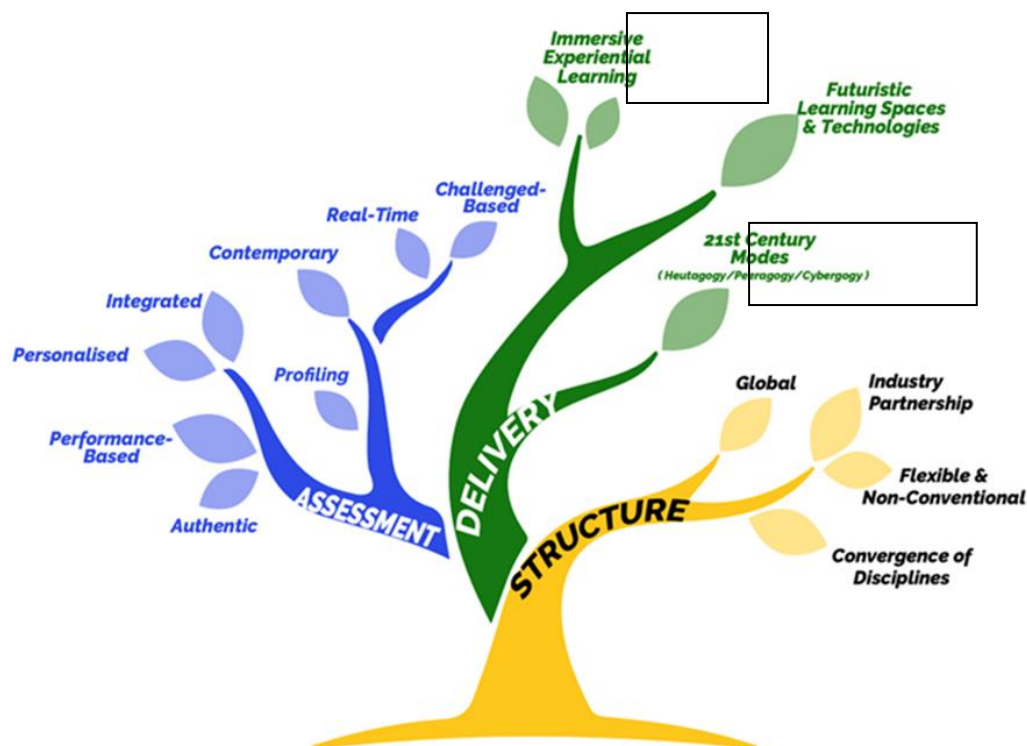


Figure 1. Framing Malaysian Higher Education 4.0: Future-Proof Talents

Source: (MOHE, 2018)

This framework also emphasizes immersive learning experiences for the students, which is crucial for fostering lifelong learning. To clarify, this particular aspect remains unclear, with its innovative principles not clearly articulated within existing online learning models, despite these models largely emphasizing collaboration.

This study addresses several problems. Firstly, traditional pedagogies are proven ineffective and unengaging for millennial learners. Additionally, current learning paradigms remain predominantly teacher-centered, limiting learners' creativity and innovation. Lastly, there is a noticeable lack of engagement between students and educators during online learning. Although the literature highlights various ways to motivate and engage students—such as lecturer enthusiasm, interactive classes, group activities, and active learning methods—these conditions are challenging to sustain in online settings, especially for sessions lasting more than three hours. Some studies have even found these activities to be of limited value, with student participation often reduced to mere formalities rather than genuine engagement (Herodotou et al., 2019; Lee, Hodgson, Chan, Fong, & Cheung, 2020). To address these challenges, implementing a well-designed, immersive, and engaging online learning cycle may significantly enhance the effectiveness of current online learning practices. This study aims to analyze effective strategies based on 21st-century pedagogical innovations that promote immersive and engaging online learning for higher education students. A systematic literature review was conducted to identify these relevant strategies. Hence, the research questions that guide this study are as follows:

What are the suitable strategies based on 21st-century innovative pedagogies that are relevant to promoting an immersive and engaging online learning environment for higher education students?

Systematic Literature Review Method

The systematic literature review (SLR) method was used to analyze papers pertaining to suitable strategies in an online classroom. There are five stages suggested by Nunes (2016): searching, identification, screening, eligibility, and inclusion (Nunes, Luz, Lemos, & Nunes, 2016). In the identification phase (Figure 2), five search strings were used to search for relevant articles: innovative pedagogies; 21st century education AND innovative pedagogies; innovative pedagogies AND student engagement; innovative pedagogies AND higher education; innovative pedagogies AND strategies.

The effort successfully identified a total of 210 papers. Initially, open access journals such as Emerald, Science Direct, Springer, Sage, and Taylor and Francis were searched to ensure a broad range of findings. The search string included the word "AND" to refine the study focus. During the screening phase, redundant papers were excluded, resulting in 199 relevant papers. Further scrutiny narrowed down the selection to the topic of interest, excluding an additional 132 papers. The remaining 67 papers underwent further filtering based on their titles and abstracts, identifying 28 papers that addressed innovative pedagogical strategies. Finally, to focus specifically on online learning, a thorough review was conducted on these remaining papers to include the most relevant ones containing innovative pedagogy strategies and activities.

Consequently, 12 papers that discuss innovative pedagogical strategies in online learning environments were identified. These papers, which include documented evidence of student performance achievements, were thoroughly analyzed in subsequent stages. It was observed that these papers are interconnected through their use of strategies, activities, and representation of frameworks. Figure 2 shows the summary of the distribution of studies included and excluded from the systematic review.

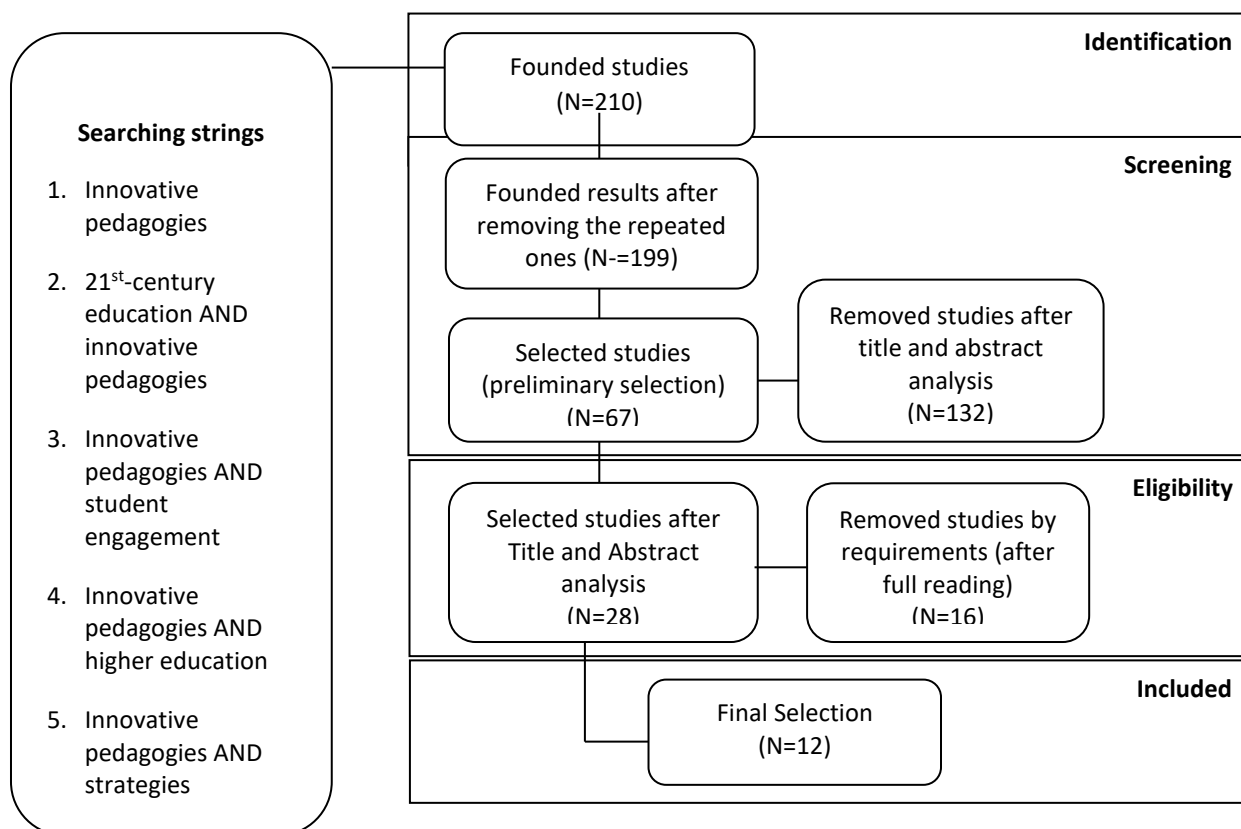


Figure 2. Distribution of studies included and excluded from the systematic review

Findings and Discussion

The initial phase of this analysis involves identifying innovative pedagogical strategies and activities utilized in teaching and learning. Given the variety of available strategies, the selection of papers must closely align with the context of online learning environments. Papers that discuss strategies without integrating terms specific to online learning were deemed unsuitable for this analysis and therefore excluded. Table 1 shows a summary of the paper analysis of the findings.

Table 1

Analysis of suitable strategies based on 21st-century innovative pedagogies by paper

Author (s)	Study domain	Strategies	Remarks
(Karunanayaka, 2023)	Teaching and learning	1. Scenario-based learning 2. Practical task 3. Active participation 4. Collaborative learning 5. Creating	Teaching and learning is designed using meaningful learning experiences and productive learning environment for students to engage with online learning tasks
(Itow, 2020)	Science education	1. Contextualised lesson concepts 2. Peer reviews 3. Constructive feedback and discussion	Students seem to be agents of learning, where students take an active and participatory role in their own learning process.
(Islam, Sarker, & Islam, 2022)	E-learning	1. Collaborative learning 2. Peer discussion 3. Online forum	Encourage students to discuss, give comments, and practice self-reflection so that students have

		4. Flexibility 5. Reflection	more autonomy over their own learning.
(Herodotou et al., 2019)	Digital Education	Formative analytics	Teaching and learning focused on assisting the learner in reflecting on their learning, what can be improved, which goals can be achieved, and how to improve further.
(Peschl et al., 2021)	Entrepreneurship Education	1. Flipped classroom 2. Learning through failure 3. Experiential learning 4. Problem solving 5. Provide feedback	Teaching and learning addressed the students' ability to solve complex problems, deal with uncertainty, learn from failures, adopt alternate viewpoints, and work effectively in a team.
(Zhao, He, & Su, 2021)	Teaching and learning	1. Flipped classroom 2. Task-driven 3. Hands-on	Students engage with instructional content outside of class, typically through pre-recorded lectures, readings, or other multimedia materials. This allows students to learn at their own pace and review the material as needed.
(Portuguez Castro & Gómez Zermeño, 2020)	E-learning	1. Challenge based learning 2. Group works 3. Presentation 4. Forum 5. Blog intervention	Students were faced with a series of challenges related to community issues that required collaborative solutions with both their peers and teachers.
(Chiu & Lee, 2019)	Teaching and Learning	1. Innovative experiential learning 2. Problem-solving 3. Individual task 4. Reflective observation	Students are tasked with solving a real-life problem related to their daily life experiences by embedding ICT elements that they are familiar with within a normal classroom setting or online classroom setting.
(Burke & Larmar, 2021)	Online Learning	1. Caring relations 2. Dialogue 3. Practice supportive environment 4. Specific feedback on caring response	Teaching and learning in the online environment focus on the pedagogy of care, emphasizing caring relationships and a supportive atmosphere based on the Framework of Moral Education (Noddings, 2010).
(Lee et al., 2020)	General education	1. Immersive virtual reality 2. Experiential learning	Students gained a deeply personal and immersive experience by going through scenarios and virtually exploring famous locations around the world. This allowed them to develop a better understanding of the subject matter through the use of virtual reality technology.
(Tsekhmister, 2022)	Digital Pedagogies	1. Video tutorials 2. Social media 3. Flipped classroom	Video tutorials, social media, and flipped classroom approaches had significant impacts on student learning in terms of enhancing student involvement, engagement, communication, critical discussions, and the student-teacher relationship.

(Bossaller, 2016)	Online Learning	Service learning	Focus on experiential learning with the added component of service. Students develop their experience by providing a beneficial service to the community through hands-on work, which can also be conducted online.
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Upon reflection of the approaches, it was found that most of the papers share approximately the same theme. Most of the papers use self-directed learning as a strategy where students take the initiative to diagnose their learning needs, formulate learning goals, identify resources for learning, choose and implement learning strategies, and evaluate learning outcomes (Herodotou et al., 2019; Islam et al., 2022; Itow, 2020; Karunanayaka, 2023; Zhao et al., 2021). It involves learners being responsible for their own education, driven by their intrinsic motivation, and often requires a high degree of self-discipline. Another strategy used in previous studies was granting autonomy to students by giving them more control and responsibility over their learning process (Herodotou et al., 2019; Islam et al., 2022; Itow, 2020; Lee et al., 2020; Zhao et al., 2021). Letting students work at their own pace, providing flexibility in timelines for assignments or projects, and encouraging students to set their own learning goals and monitor their progress.

This strategy has numerous benefits, including increased motivation and engagement, as well as the development of essential lifelong learning skills. Most of the papers also emphasize students' active participation in their own learning and peer collaboration. These strategies go beyond passive listening by encouraging students to actively participate through discussion, problem-solving, collaboration, and hands-on activities (Bossaller, 2016; Burke & Larmar, 2021; Chiu & Lee, 2019; Itow, 2020; Karunanayaka, 2023; Peschl et al., 2021; Portuguese Castro & Gómez Zermelo, 2020; Tsekhmister, 2022). These activities are crucial for deep learning, as they help students develop critical thinking skills, retain information better, and apply knowledge in practical contexts.

The majority of academic research underscores the importance of metacognitive strategies, which empower learners to develop a more organized, engaged, and reflective approach to their studies. Consequently, this results in improved learning achievements and more meaningful educational experiences (Islam et al., 2022; Itow, 2020; Lee et al., 2020; Peschl et al., 2021). Metacognition allows students to develop a deeper understanding of their learning methods, empowering them to assess and enhance their learning approaches. Strategies such as encouraging autonomy and fostering self-directed learning interconnect with this approach.

Several reviewed studies emphasize the significance of fluidity and flexibility. These approaches facilitate environments that cater to the requirements of all learners, boosting their involvement, contentment, and overall academic accomplishment (Bossaller, 2016; Burke & Larmar, 2021; Itow, 2020; Tsekhmister, 2022; Zhao et al., 2021). They also offer insights into adaptive learning, encompassing customized learning pathways, adaptable scheduling, and a diverse array of learning resources. Strategies that prioritize fluidity and flexibility in online education are pivotal in accommodating diverse learning needs and

dynamic settings. They empower learners to adjust their methods seamlessly, ensuring effective and tailored learning experiences.

The findings suggest that educators should prioritize innovative pedagogies like heutagogy and peeragogy to enhance students' experience and engagement in online learning. The themes found in the review fulfill the key characteristics of innovative pedagogies. Heutagogy encompasses self-directed learning, autonomy, and metacognition, emphasizing lifelong learning and preparing learners for dynamic environments where continuous adaptation is crucial. While heutagogy emphasizes self-directed learning, it also integrates collaboration and guidance from others. In contrast, peeragogy includes themes like active participation, peer collaboration, and flexibility, emphasizing peer-to-peer learning to foster a supportive and enriching learning environment. By leveraging the collective intelligence and diverse perspectives of peers, learners can deepen their understanding, forge meaningful connections, and cultivate essential skills necessary for lifelong learning and achievement.

Conclusion

In summary, this study successfully addressed its research objectives. By conducting a thorough review of literature comprising 12 selected papers, it identified six primary themes related to innovative pedagogical strategies that are crucial in promoting immersive and engaging online learning environments. These insights offer educators valuable perspectives on how students engage in online learning through innovative pedagogies. Such understanding empowers educators to create teaching environments that cater to the diverse abilities, interests, and needs of students. While there is no one-size-fits-all instructional approach, continuous improvement and adaptation remain essential for advancing education.

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