



Development of Student-Engagement-Based Digital Learning Strategies in Higher Education.

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ABSTRACT

This study aims to understand the development of digital learning strategies based on *student engagement* in higher education. The phenomena examined include how students experience engagement, faculty-student interactions, the design of participatory activities, and socio-technical barriers in digital learning. A qualitative approach was used with a case study design, involving students, faculty, and e-learning administrators as participants. Data were collected through semi-structured interviews, participant observation, and academic documentation, and were analyzed using thematic analysis. The findings revealed four main themes: the meaning of student engagement, faculty-student interactions, participatory digital learning activities, and socio-technical barriers. These findings indicate that student engagement is influenced by the quality of interactions, pedagogical design, technological support, and socio-cultural context, rather than merely the use of digital platforms. The implications of this research include enriching the theory of *student engagement* with a focus on student experiences, providing pedagogical practice recommendations for faculty, and offering institutional policy considerations to support inclusive and meaningful digital learning. Further research is recommended to expand the institutional context and types of study programs, as well as to explore phenomenological methods or comparative studies to delve deeper into student engagement strategies.



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1. Introduction

Digital transformation in higher education has become a strategic issue in the global development of learning quality. This transformation is not only related to the use of technology but also involves shifts in how instructors design learning experiences, how students engage with course materials, and how institutions ensure that learning experiences remain meaningful in the digital space. Martin and Borup (2022) explain that student engagement in online learning must be understood as a multidimensional construct encompassing behavioral, cognitive, emotional, and social aspects. Thus, the success of digital learning cannot be measured solely by the availability of platforms, but rather by the extent to which technology fosters active participation, deep understanding, motivation, and productive academic relationships.

In the post-pandemic higher education context, digital learning is increasingly implemented through learning management systems, video conferencing, online discussion forums, digital assessments, gamification, and collaborative applications. Gamage et al. (2022) emphasize that

online and hybrid learning can enhance students' learning experiences when supported by activity designs that encourage interaction and engagement. Akpen et al. (2024) also found that online learning influences student performance and engagement when instructional strategies are systematically designed. However, field practices indicate that the digitization of learning often remains primarily administrative and technical, while aspects of student engagement are not always the primary foundation in instructional strategy design.

In Indonesia, the digitalization of higher education is advancing through the use of institutional e-learning platforms, blended learning, synchronous lectures via video conferencing applications, and the use of academic social media. Kristiana et al. (2023) demonstrate that Indonesian students' engagement in online learning exhibits significant complexity, ranging from ease of access to low levels of active participation. Martha et al. (2021) emphasize that Indonesian students' e-learning competencies are a critical factor influencing their readiness to engage in digital learning. This situation indicates that digital learning in Indonesian higher education institutions still faces challenges such as access gaps, digital literacy, academic communication patterns, and the low meaningfulness of learning interactions.

Problems in the field are evident in the tendency for students to attend virtually but not always actively engage in the learning process. Phenomena such as unactivated cameras, minimal responses in discussions, low initiative to ask questions, late submission of assignments, and merely formal participation often indicate weak student engagement. Armellini et al. (2021) found that students' assessment of the quality of digital learning experiences is significantly influenced by the clarity of instructional design and faculty support. Capone and Lepore (2022) add that student engagement, motivation, and participation in digital learning cannot be separated from the integration of technology and pedagogy. Therefore, the primary issue in digital learning is not merely how instructors use technology, but how technology is used to build participatory and reflective learning experiences.

The issue of student engagement is important to study because student engagement is a key determinant of learning quality in higher education. Anthonysamy et al. (2020) explain that self-directed learning strategies and digital literacy play a crucial role in fostering students' sustained learning. Brown et al. (2022) emphasize that online learning must be designed within a framework capable of enhancing student engagement through academic support, relevant activities, and meaningful feedback. From a social and cultural perspective, student engagement is also influenced by the instructor-student relationship, academic communication culture, self-confidence, access to devices, and learning habits. Thus, digital learning strategies must be developed contextually to align with students' needs and the characteristics of higher education institutions.

Previous studies have extensively discussed digital learning, e-learning, and student engagement, but most still focus on measuring perceptions, satisfaction, motivation, or technology usage intentions. Cranfield et al. (2021) placed greater emphasis on students' perceptions of online learning during the pandemic through a comparative study. Singh et al. (2024) demonstrated that e-learning research in higher education remains dominated by studies mapping influences, trends, and general factors. Prananto et al. (2025) also demonstrate that research on faculty support and student engagement tends to be concept-oriented. This gap indicates that qualitative research is still needed to deeply explore the meanings, experiences, and processes of developing student-engagement-based digital learning strategies.

Based on this background, this study aims to analyze and develop student-engagement-based digital learning strategies in higher education. The research focus is directed toward the experiences of students and faculty in fostering engagement, the forms of digital strategies considered effective, the barriers encountered in learning practices, and the principles for developing digital learning strategies that align with student needs. Bitar and Davidovich (2024) emphasize that digital transformation in higher education must be understood as a pedagogical

shift, not merely a technological innovation. Therefore, this study is expected to provide theoretical contributions to the development of student engagement research grounded in qualitative experiences, as well as practical contributions for faculty and institutions in designing digital learning that is more interactive, inclusive, and meaningful.

2. Materials and Methods

This study employs a qualitative approach with a case study design. The qualitative approach was chosen because this study aims to deeply understand the experiences, meanings, and processes involved in developing digital learning strategies based on student engagement. A case study was chosen because the phenomenon under investigation occurs within the real-world context of higher education—specifically, digital learning practices involving students, faculty, and institutional support systems. Chiu (2023) notes that a qualitative approach is relevant for understanding student engagement in online learning because it can reveal aspects of motivation, experience, and learning relationships in greater depth.

The research location was selected at a university that has implemented digital learning, both in the form of fully online learning and blended learning. The location was chosen purposively, considering the presence of a learning management system, the use of video conferencing tools, discussion forum activities, and institutional policies regarding digital learning. The study was conducted over one academic semester to ensure the researcher obtained sufficient data on the processes of planning, implementation, evaluation, and reflection in learning. Veluvali and Suriseti (2022) emphasize that a learning management system plays a crucial role in enhancing student engagement when used as a space for pedagogical interaction, rather than merely a repository for course materials.

Research participants consisted of students, faculty members, and academic administrators or e-learning coordinators. Students were selected based on the criteria of having participated in digital learning for at least one semester, actively using the learning platform, and being willing to provide information about their learning experiences. Faculty members were selected based on their experience in designing and implementing digital learning in the courses they teach. Academic administrators or e-learning managers were selected to provide information regarding policies, infrastructure, and technical support for digital learning. Informant selection employed purposive sampling because the researcher required participants with direct experience regarding the phenomenon under study.

The number of participants in this qualitative study was not rigidly determined from the outset but followed the principles of data sufficiency and information saturation. If data from initial participants did not yet demonstrate sufficient depth of information, the researcher could employ snowball sampling by requesting recommendations for other relevant informants. Abbas et al. (2022) demonstrate that students' experiences in using digital support tools such as online chat and chatbots can be understood more richly when researchers directly explore users' perspectives. Therefore, informant selection in this study is aimed at capturing the variety of experiences among students and faculty in utilizing digital learning strategies.

Data collection techniques were conducted through semi-structured interviews, limited participant observation, and documentation. Semi-structured interviews were used to explore students' experiences regarding forms of engagement, barriers to digital learning, interactions with instructors, learning motivation, platform usage, and expectations regarding digital learning strategies. Interviews with faculty members were designed to understand pedagogical considerations, the design of digital activities, strategies for fostering interaction, patterns of feedback provision, and the evaluation of student engagement. Rahayu et al. (2022) demonstrate that a qualitative approach can reveal students' experiences regarding motivation and engagement in e-learning in greater depth.

Observations were conducted on digital learning activities, such as synchronous meetings, discussion forums, LMS activities, collaborative assignments, and online presentations. Observations focused on patterns of student participation, forms of instructor communication, student responses to assignments, interaction dynamics, and the use of digital media in the learning process. Documentation was used to supplement interview and observation data through analysis of the course syllabus, digital instructional materials, assignment guidelines, assessment rubrics, screenshots of discussion forums, recordings of learning activities, and institutional policies. Zen and Ariani (2022) emphasize that project-based online learning can enhance student engagement when learning activities are designed to be active and contextual.

Data validity is ensured through source triangulation, method triangulation, member checking, and an audit trail. Source triangulation is conducted by comparing information from students, instructors, and e-learning administrators. Method triangulation is conducted by comparing the results of interviews, observations, and documentation. Member checking is conducted by asking participants to review summaries of interview results or the researcher's initial interpretations. An audit trail is maintained by preserving records of the research process, interview transcripts, observation notes, coding matrices, and analytical memos. Brown et al. (2022) emphasize that enhancing student engagement in online learning must be analyzed through various components of learning support to ensure a more comprehensive interpretation.

Data analysis was conducted using thematic analysis through the stages of transcription, repeated reading, coding, category grouping, theme development, and drawing conclusions. Initial codes focused on student engagement experiences, instructors' digital strategies, barriers to participation, academic support, social interaction, learning motivation, and self-regulation. Martin and Borup (2022) explain that the engagement of online learners can be understood through conceptual themes such as interaction, support, participation, and learning practices that encourage student activity. The results of the analysis were then used to formulate principles for developing digital learning strategies based on student engagement that are appropriate for the context of higher education.

3. Results and Discussions

The research findings indicate that the development of digital learning strategies based on student engagement in higher education is determined not only by the use of learning platforms, but also by how instructors design interactions, provide feedback, build academic rapport, and create learning activities that allow students to participate. Based on interview results, observations of digital learning activities, and documentation of learning tools, four main themes were identified: student engagement as a meaningful learning experience; the importance of faculty-student interaction in digital spaces; the need for participatory activity design; and socio-technical barriers in digital learning. These four themes demonstrate that student engagement is multidimensional and influenced by the interplay of pedagogical, social, academic cultural, and technological readiness factors.

The first theme indicates that students perceive engagement in digital learning not merely as attending online classes or submitting assignments, but as an experience of feeling involved, valued, and having a role in the learning process. Some students stated that they are more motivated to be active when digital learning provides opportunities to ask questions, discuss, and connect the material to real-world issues. One student remarked, "I'm more enthusiastic when the instructor doesn't just explain the material but asks questions that make us think and discuss" (M-03). This statement indicates that students' cognitive engagement emerges when digital learning is not one-sided but encourages reflection and active participation.

The second theme pertains to the role of instructor-student interaction in fostering a sense of academic connection. Interview results indicate that students feel more engaged when instructors provide prompt responses, clear feedback, and open channels of communication outside of

synchronous sessions. In observations of digital classes, students tended to be more active in courses where instructors used thought-provoking questions, discussion forums, and personalized comments on student assignments. One participant stated, “When our assignments are commented on, I feel that the instructor has truly read our work, so I want to improve my next assignment” (M-07). This finding demonstrates that feedback is not merely an evaluation tool but also a means of fostering emotional engagement and learning motivation.

The third theme indicates that participatory digital learning strategies are more effective at increasing student engagement compared to strategies focused solely on content delivery. Activities such as online group discussions, project-based presentations, interactive quizzes, weekly reflections, and the use of case studies are seen as helping students understand the material in a more contextual way. One instructor noted, “Students are more engaged when I present a case study and then ask them to find solutions in small groups. If I just lecture via Zoom, their responses are very limited” (D-02). Course syllabus documentation and LMS activity logs also indicate that courses incorporating a variety of digital activities exhibit more diverse participation patterns, such as forum comments, reflection posts, and peer discussions.

The fourth theme highlights the presence of socio-technical barriers affecting student engagement. These barriers include unstable internet connections, limited devices, burnout from attending online meetings, low self-confidence in speaking, and a learning culture that still positions the instructor as the center of knowledge. Students living in areas with limited internet access reported becoming passive participants more often out of fear that their connection would drop while speaking. One student stated, “Sometimes I want to ask a question, but the signal is unstable. In the end, I just listen and write the question in my personal notes” (M-11). This finding indicates that student engagement in digital learning cannot be separated from social, geographical, and technological infrastructure conditions.

In addition to technical barriers, this study found that academic communication norms also influence student participation. Some students hesitate to express their opinions because they fear making mistakes, lack confidence, or are not yet accustomed to discussing openly in digital spaces. In observations of the LMS forum, some students provided only brief and formal responses, such as “agree” or “interesting,” without elaborating on their arguments. This situation indicates that digital engagement requires not only technological facilities but also the cultivation of a dialogic academic culture. Consequently, digital learning strategies must create a safe space for students to ask questions, experiment, make mistakes, and refine their understanding.

Other findings indicate that students engage more readily when digital learning has a clear structure. This structure includes clear learning objectives, activity schedules, assignment instructions, assessment criteria, and realistic deadlines. Students stated that digital platforms overloaded with material but lacking guidance actually cause confusion and reduce motivation. One student explained, “There’s a lot of material on the LMS, but sometimes we’re confused about what to read first and which assignments are the highest priority” (M-05). This statement indicates that student engagement is not solely determined by the abundance of learning resources, but by the organization of the instructional design that helps students manage their learning process.

Overall, the results of this study indicate that digital learning strategies based on student engagement need to be developed through the integration of pedagogical design, social interaction, technological support, and sensitivity to the student context. Student engagement does not arise automatically through the use of digital platforms; rather, it is shaped through learning experiences that provide space for participation, emotional support, academic clarity, and relevant activities. Thus, an effective digital learning strategy is one that positions students as active agents in the learning process, not merely as recipients of content within a technological system.

Discussion

The findings of this study reinforce the view that student engagement in digital learning is a multidimensional construct encompassing behavioral, cognitive, emotional, and social engagement. Martin and Borup (2022) explain that the engagement of online learners cannot be limited to attendance or task completion but includes the quality of interactions, support, and learning activities that foster meaningful participation. These research findings align with this perspective because students who are actively engaged are not merely present in the digital classroom but also feel they have a role, understand learning objectives, receive feedback, and have space to interact with instructors and peers.

The research results also indicate that instructors' pedagogical presence is a critical factor in fostering student engagement. Instructors who provide clear guidance, thought-provoking questions, personalized feedback, and open communication channels are better able to encourage student participation. These findings align with Brown et al. (2022), who emphasize the importance of an online learning framework that supports student engagement through activity design, academic support, and the strengthening of interactions. Capone and Lepore (2022) also demonstrate that student motivation and participation in digital learning are closely linked to the integration of technology and pedagogical strategies. Thus, technology serves merely as a tool, while student engagement is shaped by the quality of instructional design and academic relationships.

Findings regarding the importance of participatory activities indicate that effective digital learning requires strategies that go beyond online lectures. Project-based activities, case studies, discussion forums, reflections, and interactive quizzes help students build cognitive and social engagement. Zen and Ariani (2022) demonstrate that project-based online learning can enhance student engagement by providing opportunities for active and collaborative work. Gamage et al. (2022) also emphasize that online and hybrid learning are more effective when students are provided with interactive learning experiences. In the context of this study, participatory activities not only increase engagement but also help students feel that digital learning is relevant to their experiences and needs.

Findings regarding the importance of feedback indicate that students need recognition of their learning processes. Feedback provided by instructors makes students feel valued and motivated to improve the quality of their learning. This expands the understanding that emotional engagement in digital learning arises not only from internal motivation but also from the experience of feeling seen and valued within the academic space. Chiu (2023), through the perspective of self-determination theory, explains that student engagement is influenced by the fulfillment of the needs for autonomy, competence, and relatedness. In this study, faculty feedback strengthened students' sense of competence, while responsive communication strengthened their sense of relatedness.

However, this study also found that student engagement cannot be separated from socio-technical barriers. Limitations in internet connectivity, devices, digital fatigue, and low self-confidence act as factors limiting student participation. These findings align with those of Kristiana et al. (2023), who demonstrated that Indonesian students' engagement in online learning is influenced by variations in experience, access, and digital learning readiness. Martha et al. (2021) also emphasized the importance of students' e-learning competencies in determining the success of digital learning. Thus, digital learning strategies in Indonesia must address disparities in access and students' ability to use technology for academic purposes.

From an academic culture perspective, this study's findings indicate that some students still view digital learning spaces as places to receive content, rather than spaces for dialogue. Passive communication patterns in LMS forums suggest that digital transformation has not fully shifted the teacher-centered learning culture. Bitar and Davidovich (2024) assert that digital transformation in higher education must be understood as a pedagogical transformation, not merely the use of technology. Therefore, digital learning strategies based on student engagement

need to foster a culture of dialogue, collaboration, and reflection so that students feel empowered to express their opinions and participate meaningfully.

The findings of this study suggest that the development of digital learning strategies based on student engagement should be approached contextually. A strategy that succeeds in one class may not be effective in another if it does not account for student characteristics, learning culture, technological readiness, and institutional support. Akpen et al. (2024) demonstrate that online learning can positively impact student performance and engagement when supported by designs aligned with learners' needs. In the context of this study, meaningful digital strategies are those that adapt learning activities to students' circumstances, provide alternative participation options, and offer continuous academic support.

Theoretically, the findings of this study enrich the literature on student engagement by demonstrating that student engagement in digital learning is a negotiated process involving instructional design, social relationships, technological readiness, and academic culture. These findings expand the understanding that engagement is not solely individual in nature but is shaped within the learning ecosystem. Practically, this research implies that instructors need to design digital learning with clear objectives, varied activities, meaningful feedback, and safe spaces for interaction. Higher education institutions also need to provide digital pedagogy training for instructors, technical support for students, and digital learning policies that emphasize not only platform usage but also the quality of the learning experience.

Future research is recommended to expand the scope of study to various types of higher education institutions, academic programs, and student characteristics to gain a more comprehensive understanding of digital learning strategies based on student engagement. Follow-up research could also employ a phenomenological approach to explore students' subjective experiences in greater depth, or utilize comparative studies to examine differences in engagement strategies between fully online learning and blended learning. Additionally, developmental research could be conducted to formulate a model of student-engagement-based digital learning strategies that can be tested in higher education learning.

4. Conclusions

This study demonstrates that the development of digital learning strategies based on student engagement in higher education is a multidimensional process involving the interplay of pedagogical design, social relationships, technological support, and academic culture. Student engagement emerges when students are given the opportunity to participate actively, receive meaningful feedback, and engage in relevant and contextual learning activities. Barriers such as limited access to technology, low self-confidence, and a culture of passive communication affect the quality of engagement; therefore, digital learning strategies need to be adapted to students' social, cultural, and technical conditions.

Theoretically, this study enriches our understanding of student engagement in the context of digital learning by emphasizing students' experiences, meanings, and negotiations of engagement. Practically, this study implies the need for instructors to design participatory digital activities, provide constructive feedback, and create safe and inclusive spaces for interaction. Institutional policies must also support technological readiness and the enhancement of digital competencies for both faculty and students. Future research is encouraged to expand the scope to various types of higher education institutions and learning approaches, including the use of phenomenology or comparative studies to deepen understanding of student engagement strategies.

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