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Implementation of an Impactful Curriculum Based on Digital Competence

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ABSTRACT

The rapid advancement of digital technology has made digital competencies essential in higher education, requiring universities to equip students with critical thinking, digital information management, online collaboration, and ethical technology use. However, the implementation of an impact-based curriculum aimed at developing digital competencies faces several challenges, including varying levels of students' digital literacy, limited access to digital devices and internet connectivity, and lecturers' readiness to facilitate digital learning. This study employed a descriptive qualitative research design to describe the implementation of an impact-based curriculum and analyze its implications for students' digital competency development. The research subjects consisted of lecturers and students involved in digital learning in higher education. Data were collected through interviews, observations, and documentation, while data analysis involved data reduction, data presentation, and conclusion drawing. The findings indicate that curriculum implementation begins with systematic lesson planning, syllabus alignment, and the provision of flexible digital learning materials. Digital platforms facilitate content delivery, academic discussions, virtual group collaboration, and digital project development, thereby encouraging active student engagement. Lecturers serve as facilitators by providing conceptual guidance, technical instructions, and continuous feedback, while adaptive teaching strategies help address technological constraints and differences in digital literacy. These findings highlight the importance of systematic curriculum planning, lecturer support, and adaptive learning strategies in facilitating the development of students' digital competencies in higher education.

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1. INTRODUCTION

The development of digital technology has fundamentally transformed higher education worldwide, changing how information is produced, accessed, and utilized in the learning process. This digital transformation has reshaped teaching methods, curriculum design, and student learning experiences, requiring higher education institutions to adapt their educational practices to the demands of the Fourth Industrial Revolution (Industry 4.0) [1]. Consequently, universities are expected to prepare graduates who are not only academically competent but also equipped with the digital competencies necessary to navigate an increasingly digitalized world. These competencies include critical thinking, the ability to access, manage, and analyze digital information, effective collaboration in digital environments, and the ethical use of information technology in various professional and social contexts (UNESCO, 2023). Therefore, higher education institutions need to develop appropriate infrastructure and pedagogical strategies to ensure that students acquire the digital competencies required to meet the challenges of the twenty-first century [2].

Digital competencies refer to a set of skills that enable students to effectively and responsibly use digital technologies, including information and data literacy, digital communication and collaboration, digital content creation and management, and digital security. The European Commission (2022) emphasizes the importance of these competencies as essential learning outcomes in higher education, as they enable students to critically evaluate information, communicate effectively, create digital content, and navigate digital environments safely and responsibly. Therefore, universities need to integrate digital competencies into their curricula to ensure that students can not only understand theoretical concepts but also apply their knowledge in practical digital contexts [3]. Developing these competencies is essential for fostering students' adaptability, creativity in problem-solving, and ability to collaborate across disciplines, thereby preparing graduates to meet academic, professional, and societal challenges in an increasingly digital world [1].

To address the challenge of developing students' digital competencies, universities need to design curricula that emphasize measurable improvements in students' skills rather than merely delivering content. An effective approach is Outcome-Based Education (OBE), which focuses on achieving clearly defined learning outcomes that are relevant, applicable, and meaningful to students' academic, professional, and social contexts. Biggs and Tang emphasize the importance of aligning learning outcomes, teaching and learning activities, and assessment methods to ensure that students not only understand theoretical concepts but also develop the ability to apply their knowledge and skills in real-world situations. In the context of digital competencies, OBE requires universities to establish measurable learning outcomes related to digital literacy, critical thinking, digital problem-solving, and the effective use of digital technologies. Therefore, universities should align OBE-based curricula with industry requirements, emerging digital trends, and contemporary social challenges to ensure that graduates possess practical digital competencies and are prepared to compete in the global workforce [4].

The impactful, digital competency-based curriculum is designed to systematically integrate digital technology into all aspects of lecture-based learning by establishing a strong

turnitin Page 10 of 23 - Integrity Submission Submission ID trn:oid:::1:3697646748

relationship between technology, pedagogy, and digital competence. Technology serves as a means of accessing information, analyzing data, and facilitating digital collaboration, while pedagogy guides the purposeful use of technology to support meaningful learning experiences. In this context, lecturers' digital competence involves selecting and integrating appropriate digital tools, designing technology-enhanced learning activities, and assessing students' learning outcomes effectively. Meanwhile, students' digital competence focuses on using digital technologies responsibly to access and evaluate information, think critically, solve real-world problems, and collaborate effectively in digital environments [5]. Digital competency frameworks, such as DigCompEdu, provide conceptual guidance for integrating technology into educational practices and developing digital skills, thereby making lecture-based learning more effective, contextual, and student-centered [6], [7].

However, implementing an impactful, digital competency-based curriculum in lectures continues to face several challenges. Recent studies highlight a gap between digital transformation policies and actual teaching practices in higher education, particularly due to variations in lecturers' digital competencies in designing and managing technology-enhanced learning [8]. Furthermore, students' readiness to use technology effectively for academic purposes, including information literacy and digital resource management, varies considerably, potentially limiting the achievement of intended digital competencies [9]. Despite these findings, an empirical and contextual gap remains in understanding how these challenges manifest in actual university lecture settings, particularly regarding the alignment between curriculum expectations, lecturers' instructional practices, and students' demonstrated digital competencies. This gap highlights the need for further investigation into how digital competency-based curricula are implemented in practice and the extent to which they support the development of students' digital competencies in higher education.

Another challenge that is frequently encountered is the limited use of technology, which often remains confined to administrative tasks or the delivery of learning materials, rather than being integrated into pedagogical strategies that holistically develop students' digital competencies [10]. This limitation highlights a potential research gap concerning the integration of technology into innovative learning approaches, such as project-based learning, problem-based learning, and blended learning, to support the comprehensive development of students' digital competencies in higher education [11]

Addressing these challenges requires a comprehensive approach to curriculum implementation, including structured curriculum design, improved lecturers' digital pedagogical competencies, and sustained institutional policy support. Such support involves providing adequate technological infrastructure, strengthening the digital competencies of both lecturers and students, and evaluating learning outcomes based on measurable competencies [12]. However, the effectiveness of a digital competency-based curriculum depends not only on its design but also on how it is implemented in higher education learning environments. Therefore, examining its implementation is essential to understanding whether the curriculum effectively supports students' digital competency development and prepares them to respond to the evolving demands of digital transformation in higher education and the professional world.

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turnitin Page 11 of 23 - Integrity Submission Submission ID trn:oid:::1:3697646748

Based on these challenges, this study aims to examine the implementation of a digital competency-based curriculum in higher education and analyze its contribution to students' digital competency development. This research is important because it can provide insights into the extent to which curriculum implementation supports the development of relevant digital competencies, as well as identify aspects that require further improvement. The findings are expected to contribute theoretically and practically to the development of an adaptive, relevant, and outcome-oriented higher education curriculum that responds to the needs of the digital era.

2. METHOD

a. Research Approach and Design

This study adopts a qualitative descriptive approach to examine the implementation of a digital competency-based curriculum in higher education. This approach is intended to provide a detailed description of curriculum implementation, including learning planning, the integration of digital technologies into instructional activities, lecturers' roles, student engagement, and challenges encountered during the learning process. The study focuses on describing how digital competencies are incorporated into learning outcomes, teaching strategies, and learning activities within the higher education context.

b. Research Location and Context

The research was conducted at [name of university], in [city, country], within [faculty, department, or study program]. The research context involved higher education courses that incorporated digital technologies into teaching and learning activities. The investigation focused on curriculum planning, the use of digital learning materials and platforms, online discussions, virtual group work, digital project assignments, and the assessment of students' digital competencies.

c. Research Participants and Sampling Technique

The research participants consisted of [number and categories of participants, such as lecturers, students, or curriculum coordinators]. Participants were selected based on their involvement in or experience with the implementation of digital competency-based learning.

d. Data Collection Techniques

Data collection involved classroom observations and document analysis, as indicated in the manuscript's discussion of learning practices and learning documentation. Classroom observations focused on the integration of digital technologies into instructional activities, including online discussions, virtual collaboration, digital assignments, student participation, and lecturers' facilitation of learning. Document analysis focused on relevant curriculum and instructional documents, including Semester Learning Plans (Rencana Pembelajaran Semester/RPS), course learning outcomes, digital teaching materials, and available learning assessment documents. These documents were examined to identify how digital competencies were incorporated into curriculum planning, instructional activities, and learning assessments.

turnitin Page 11 of 23 - Integrity Submission Submission ID trn:oid:::1:3697646748

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e. Research Instruments

The research instruments comprised [the actual instruments used in the study]. For classroom observations, the instruments may include an observation guide or checklist covering digital technology integration, lecturer facilitation, student engagement, and the development of digital competencies. For document analysis, an analysis guide may be used to examine learning outcomes, instructional strategies, digital learning resources, and assessment criteria.

f. Data Analysis Technique

The data analysis procedure consisted of [the actual analytical method used]. The analysis should explain how information obtained from observations and documents was organized, examined, and interpreted to address the research objectives. If the study employed thematic analysis, the procedure may include familiarization with the data, initial coding, development of themes, review of themes, and interpretation of the findings. The resulting themes may address curriculum planning, digital learning implementation, lecturer facilitation, student digital competency development, and implementation challenges.

g. Data Validity and Trustworthiness

The trustworthiness of the research findings was established through [the procedures actually employed to ensure data credibility and consistency]. If multiple data sources were examined, triangulation may be used to compare classroom observations with curriculum documents and other relevant evidence. Additional procedures, such as member checking or an audit trail, may be reported if they were actually conducted.

h. Research Ethics

The study followed the applicable ethical requirements for educational research. Where participants were involved, they were informed about the research purpose, participation requirements, and confidentiality measures, and consent was obtained in accordance with the applicable procedures.

3. RESULTS AND DISCUSSION

The results of the document analysis indicate that the implementation of a digital competency-based curriculum in higher education begins with systematic and well-structured learning planning. The review of the Semester Learning Plans (Rencana Pembelajaran Semester/RPS) examines how digital competencies are incorporated into Course Learning Outcomes (CPMK), learning activities, and assessment strategies. The inclusion of digital competencies across these components indicates that curriculum planning provides a foundation for aligning learning objectives, instructional methods, and assessment practices with the development of students' digital competencies. This alignment suggests that digital skills are intended to be developed through planned learning experiences rather than through incidental exposure to technology. Furthermore, integrating digital competencies into learning activities and assessments can create opportunities for students to critically evaluate digital information, collaborate in virtual environments, and apply digital tools to solve real-world problems. Therefore, systematic learning planning plays an

turnitin Page 13 of 23 - Integrity Submission Submission ID trn:oid:::1:3697646748

important role in ensuring that the implementation of a digital competency-based curriculum is coherent, purposeful, and oriented toward measurable learning outcomes.

Furthermore, based on interview findings, lecturers perceive the curriculum as a guideline for directing and achieving students' digital competencies. They view the systematic integration of digital competencies into learning plans as essential for ensuring that learning activities are aligned with the demands of the 21st-century workforce and the ongoing digital transformation in higher education. This integration is reflected in the development of students' information literacy, digital content creation, online collaboration, and ethical use of technology. These findings suggest that lecturers understand the curriculum not merely as a framework for organizing learning activities but also as a strategic instrument for guiding the development of students' digital competencies and preparing them to navigate increasingly complex technological environments in both academic and professional contexts [13].

During the planning stage, lecturers revise the Semester Learning Plan (Rencana Pembelajaran Semester [RPS]) by explicitly integrating digital competencies into the intended learning outcomes, learning activities, and assessment strategies of each course. These competencies encompass several key dimensions, including digital information literacy, the effective use of learning technologies, online collaboration, and ethical awareness in digital environments. To clarify how these competencies are incorporated into instructional planning, Table 1 presents the identified dimensions of digital competence, their forms of integration into the RPS, and examples of corresponding learning activities.

Table 1 Integration of Digital Competencies into the Semester Learning Plan

Digital Competency Dimension	Forms of Integration into the RPS	Examples of Learning Activities
Digital information literacy	Incorporating learning outcomes that require students to search for, evaluate, verify, and use digital information critically and effectively.	Searching for scholarly articles through academic databases, evaluating the credibility of online sources, and synthesizing information from digital references.
Use of learning technologies	Integrating digital tools, applications, and learning platforms into instructional methods and assessment strategies.	Using a learning management system (LMS), interactive presentation tools, discipline-specific software, and digital quizzes to support learning.
Online collaboration	Establishing learning outcomes and activities that develop students' ability to communicate, coordinate tasks, and collaborate effectively in digital environments.	Completing group projects using shared documents, participating in online discussions, and coordinating group assignments through digital collaboration platforms.
Digital ethics and responsibility	Embedding ethical standards into learning activities and assessment criteria, particularly regarding copyright, academic integrity, data privacy, information security, and responsible technology use.	Citing digital sources appropriately, respecting intellectual property rights, protecting personal data during online activities, and evaluating the ethical implications of digital content.

Source: Authors' synthesis based on the integration of digital competencies into instructional planning.

As illustrated in Table 1, the integration of digital competencies into the RPS involves more than simply including technology-related content in course descriptions. It

turnitin Page 13 of 23 - Integrity Submission Submission ID trn:oid:::1:3697646748

turnitin Page 14 of 23 - Integrity Submission Submission ID trn:oid:::1:3697646748

requires the systematic alignment of learning outcomes, instructional activities, and assessment strategies with specific digital competencies that students are expected to develop. For example, digital information literacy can be assessed through students' ability to evaluate the credibility of academic sources, while online collaboration can be demonstrated through their contributions to collaborative projects. Similarly, digital ethics can be evaluated through the appropriate citation of sources and the responsible handling of digital information. This structured approach enables lecturers to establish clearer learning expectations and more measurable indicators of student achievement. Consequently, the RPS serves as a practical framework for integrating digital competencies into academic learning while preparing students to respond to the evolving demands of digitally mediated educational and professional environments [5].

The formulation of students' digital competencies in course learning outcomes reflects alignment with the European Digital Competence Framework (DigComp), which emphasizes the comprehensive development of digital skills. Digital competence is understood not merely as the technical ability to use digital devices but also as encompassing the cognitive, social, and ethical dimensions of digital technology use. Accordingly, students' digital competencies are mapped to the DigComp framework, which covers information and data literacy, communication and collaboration, digital content creation, safety, and problem-solving. These competencies enable students to evaluate digital information critically, solve problems using digital tools, collaborate effectively in digital environments, and use technology safely and responsibly, thereby supporting effective learning in higher education [3]. These findings suggest that an effective digital competency-based curriculum should aim to produce graduates who can adapt to technological developments while demonstrating social awareness, ethical responsibility, and professional competence within the digital ecosystem.

The analysis of learning documentation involved a review of [number] Semester Learning Plans (RPS), [number] e-modules, [number] online journal articles, [number] learning videos, and [number] other digital learning resources used in lectures. The reviewed materials were accessed through [name of Learning Management System (LMS)] and other digital learning platforms. The findings indicate that digital resources constitute a major component of the teaching materials used in the courses examined. These resources enable students to access learning materials flexibly and independently, both during face-to-face lectures and outside scheduled class hours. Furthermore, the availability of diverse digital resources exposes students to various information formats and provides opportunities to develop digital literacy skills, particularly in accessing, evaluating, and utilizing digital information. The integration of these resources also supports more flexible learning experiences that accommodate students' individual learning needs and paces. Overall, the findings highlight the role of digital technology in supporting lecture-based learning and facilitating more dynamic and inclusive learning interactions [14].

The intensive use of digital learning resources reflects lecturers' efforts to create a learning environment that aligns with the characteristics and learning needs of students in the digital era. Based on classroom observations, students demonstrate independent learning by accessing digital learning materials, searching for relevant information from various

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turnitin Page 15 of 23 - Integrity Submission Submission ID trn:oid:::1:3697646748

online sources, comparing information across sources, and evaluating the credibility of the information before incorporating it into their learning activities. These practices encourage students to develop information literacy, critical thinking, and the ability to use digital resources effectively. Furthermore, students' engagement with digital learning resources indicates that digital literacy extends beyond technical proficiency to encompass cognitive and evaluative competencies that contribute to learning quality and preparedness for the workplace, where analytical thinking and effective data utilization are essential [2]. These findings highlight the importance of strengthening digital literacy as an integral component of higher education strategies to develop competent, creative, and innovative graduates.

During the implementation phase, classroom observations were conducted across sessions to examine how digital technology was integrated into teaching and learning activities. The observed activities included the delivery of learning materials through digital platforms, online discussions, the exchange of academic information, collaborative learning tasks, and student participation in technology-mediated classroom interactions. The observations also focused on patterns of interaction between lecturers and students, particularly how lecturers facilitated discussions, provided feedback, responded to students' questions, and encouraged active participation. Meanwhile, students engaged in the learning process by asking questions, expressing their opinions, responding to lecturers' feedback, and collaborating with their peers through digital platforms. These observations indicate that digital technology served not only as a medium for delivering instructional content but also as a platform for facilitating communication, collaboration, and active engagement. Consequently, digital learning formed an integral part of pedagogical practices in higher education, supporting more interactive, collaborative, and reflective learning experiences [15].

Online learning platforms, such as institutional Learning Management Systems (LMS), Moodle, Google Classroom, and Microsoft Teams, are utilized to deliver course materials through the uploading of teaching resources, the presentation of multimedia content, and the provision of digital references. These platforms also facilitate synchronous and asynchronous discussions, enabling students to participate actively in learning activities regardless of time and location. Furthermore, assignment submission, assessment, and feedback are systematically managed through these digital platforms, making the learning process more transparent, well-documented, and sustainable. The use of these platforms demonstrates that technology serves not merely as a supporting tool but also as an integral component of a more structured, measurable, and accountable learning process [16].

Learning activities are designed to encourage active student participation through various digital technology-based activities. Online discussions provide opportunities for students to express their opinions, ask questions, and critically respond to their peers' ideas. Student participation is assessed through measurable indicators, including the frequency of forum contributions, the quality and relevance of discussion responses, involvement in virtual group work, and the timely submission of digital assignments. Virtual group work is also implemented to develop students' academic collaboration skills in digital environments, enabling them to work together effectively toward shared learning objectives. These

turnitin Page 15 of 23 - Integrity Submission Submission ID trn:oid:::1:3697646748

turnitin Page 16 of 23 - Integrity Submission Submission ID trn:oid:::1:3697646748

activities reflect the principles of student-centered learning, which position students as active participants in the learning process, while lecturers act as facilitators and mentors [17].

In addition to discussions and group work, digital project-based assignments have become a prominent learning strategy in higher education. Students are tasked with producing digital products, such as interactive presentations, data-driven digital reports, and simple learning media relevant to the course material. The assessment of these projects can be supported by structured rubrics that evaluate content accuracy, creativity, digital tool proficiency, information presentation, and critical thinking. Evidence of students' achievements can be documented through project assessment scores, rubric-based evaluations, and examples of completed digital products. These assessments provide a basis for evaluating students' ability to integrate conceptual knowledge with practical digital skills. Through this approach, learning becomes more contextual and meaningful while enhancing students' abilities to design, communicate, and critically evaluate digital information [18].

Learning practices that utilize digital technology in a planned manner demonstrate that digital learning is systematically designed and implemented through clearly defined learning plans, learning management systems (LMS), and assessment strategies. Learning plans outline the intended learning outcomes, digital competencies to be developed, and learning activities to achieve these objectives. Meanwhile, LMS platforms facilitate the structured delivery of learning materials, student engagement, online collaboration, and monitoring of learning progress. Assessment strategies, including digital assignments, online quizzes, project-based assessments, and performance evaluations, provide measurable evidence of students' learning achievements and digital competency development. These elements demonstrate that digital learning is not implemented spontaneously or merely as a situational response to specific conditions, but is grounded in deliberate pedagogical planning that considers learning objectives, student characteristics, and the effectiveness of instructional strategies. This finding highlights the fundamental distinction between systematically designed online learning and temporary, reactive emergency remote teaching, while emphasizing the importance of a comprehensive approach to developing students' digital competencies [19].

Observations indicate that students are actively involved in digital technology-based learning activities during lectures. This involvement is reflected in their participation in online discussions, submission of digital assignments, and delivery of digital presentations. For example, students contribute ideas and respond to their peers' opinions during online discussions, while digital presentations provide opportunities for them to communicate their understanding of course materials using digital tools. These observations suggest that students are not merely passive recipients of information but actively construct knowledge through interactions with digital learning resources, lecturers, and peers in online learning environments. This finding highlights a shift toward a more participatory, interactive, and competency-based learning paradigm, in which digital technology serves as a tool to support student engagement, collaboration, and the development of digital competencies [13].

Students are required to independently search for and explore digital resources relevant to their course materials, such as academic search engines, scientific journal

turnitin Page 16 of 23 - Integrity Submission Submission ID trn:oid:::1:3697646748

turnitin Page 17 of 23 - Integrity Submission Submission ID trn:oid:::1:3697646748

databases, institutional repositories, and e-learning platforms. This activity develops students' digital information literacy by enabling them to identify credible sources, evaluate information, and integrate relevant references to support their understanding of course materials [14].

In addition to information-seeking skills, students are guided to evaluate and process digital information critically. They are trained to assess the credibility of digital sources, compare multiple perspectives, interpret data, and conduct evidence-based analyses. Evidence of these competencies can be demonstrated through students' assignments, assessment rubrics, and lecturers' observations or interview statements regarding students' ability to evaluate digital sources. For example, students' assignments may show their ability to distinguish credible academic references from unreliable online sources, identify potential bias, and justify their arguments using relevant evidence. Assessment rubrics can further document students' proficiency in evaluating source credibility, analyzing information, and supporting conclusions with reliable evidence. These findings provide a basis for assessing the development of students' critical thinking and analytical skills as essential components of digital competence in higher education and the modern workplace. Through these learning activities, students are expected to make informed academic and professional decisions while developing adaptive, reflective, and responsible attitudes toward complex digital challenges [2].

Student learning outcomes are presented in various creative and interactive digital formats, such as multimedia presentations, infographics, digital reports, online portfolios, and short educational videos. For example, students may create an infographic summarizing key concepts from a lecture, develop a multimedia presentation incorporating relevant data and visual elements, compile an online portfolio documenting their learning progress, or produce a short educational video explaining a specific topic. These digital products serve as concrete evidence of students' learning achievements and demonstrate their ability to apply digital skills in academic contexts. Presenting learning outcomes in digital formats also enables students to integrate technical proficiency with academic communication skills, particularly the ability to convey ideas systematically, persuasively, and professionally. Furthermore, this activity strengthens students' capacity to communicate effectively through digital media, preparing them to meet the demands of an increasingly digitalized and collaborative professional environment [3].

The active involvement of students throughout the digital learning process reflects the application of student-centered learning principles in technology-based lectures. This approach is evident in the learning activities described previously, including online discussions, digital projects, and presentations, which encourage students to actively explore information, exchange ideas, collaborate with peers, and communicate their findings. Through these activities, students take greater responsibility for planning, managing, and reflecting on their own learning, while lecturers act as facilitators who provide guidance and support. These findings demonstrate that integrating digital technology into the learning process can promote student-centered learning by fostering learner autonomy, creativity, collaboration, and academic responsibility [17].

turnitin Page 17 of 23 - Integrity Submission Submission ID trn:oid:::1:3697646748

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Furthermore, the research findings indicate that lecturers play a strategic and multifaceted role as facilitators in implementing digital technology-based learning, fundamentally transforming classroom interactions and the traditional teacher-centered learning paradigm. Rather than focusing primarily on the one-way transmission of knowledge, lecturers actively manage and facilitate the learning process within digitally mediated environments. In practice, this involves managing discussion forums on Learning Management Systems (LMS), providing technical guidance on the use of digital learning platforms, designing project-based learning activities that incorporate digital tools, and delivering feedback through online platforms. These activities enable lecturers to foster active student engagement, sustain motivation, encourage collaboration, and support students in constructing their own understanding through meaningful learning experiences.

3.1 Results

Lecturers integrate digital technologies into learning activities by using interactive digital tools, multimedia resources, and collaborative platforms. They also design problem-solving tasks that encourage students to explore learning materials, participate in critical discussions, and reflect on their learning experiences. In addition, lecturers provide opportunities for students to engage with real-world scenarios and digital simulations to apply theoretical concepts to practical situations. Throughout the learning process, lecturers guide students' independent inquiry, provide timely feedback, and support the development of digital literacy and responsible technology use.

3.2 Discussion

These findings reflect the role of lecturers as facilitators in digital learning environments, in which learning extends beyond the transmission of knowledge to the active construction of understanding. The integration of interactive technologies, collaborative platforms, and authentic problem-solving activities supports student engagement and encourages the development of higher-order thinking skills, including analytical reasoning, creativity, and collaborative problem-solving. Furthermore, scaffolding, guided inquiry, and timely feedback are important components of effective digital learning facilitation because they help students navigate learning resources, develop greater autonomy, and evaluate information critically. The emphasis on digital literacy and ethical technology use also highlights the importance of preparing students to engage with digital environments responsibly and effectively. Therefore, the facilitator role requires lecturers to combine appropriate technological tools with purposeful pedagogical strategies to promote meaningful learning and the development of students' digital competencies.

The study suggests that when lecturers adopt the role of facilitators, learning may become more meaningful and contextual by bridging theoretical knowledge with practical application. This approach also aligns with the development of 21st-century competencies, including adaptability, technological fluency, and the ability to navigate complex digital environments. Therefore, positioning lecturers as facilitators is important for supporting student engagement and learning outcomes, while also helping higher education curricula remain responsive and relevant to evolving educational and professional needs. By fostering

these competencies, this approach has the potential to support students' readiness to participate in an increasingly digital, interconnected, and knowledge-intensive global society [15].

Lecturers provide clear and structured conceptual guidance on learning objectives and their relationship to the digital competencies students are expected to develop. This guidance goes beyond the theoretical explanation of course materials by emphasizing the relevance of digital competencies in academic and professional contexts. Lecturers explain how digital information literacy, online collaboration, and ethical awareness in the use of technology can be integrated into learning activities and applied to real-world situations. Through systematic explanations and relevant examples, lecturers help students understand the purpose of each learning activity and its alignment with the intended course learning outcomes. This conceptual guidance serves as an essential foundation for ensuring that digital competencies are integrated meaningfully into the learning process rather than treated as separate or supplementary skills.

The conceptual guidance provided by lecturers has important implications for students' understanding of digital competencies and their application in academic and professional settings. By understanding the connection between learning objectives and digital competencies, students can recognize the relevance of digital learning activities to their academic development and future careers. This understanding encourages students to develop critical thinking, engage in data-driven problem-solving, and analyze digital information more effectively. Furthermore, students become more aware of the importance of responsible technology use and productive collaboration in digital environments. Consequently, structured conceptual guidance can support the development of students who are more independent, adaptable, and capable of applying digital competencies to various academic and professional challenges, thereby promoting meaningful learning and the acquisition of essential twenty-first-century skills [20].

In addition to conceptual guidance, lecturers provide technical guidance on the use of various digital learning platforms and applications. This guidance includes instructions on accessing the Learning Management System (LMS), uploading assignments, using online collaboration applications, and operating digital learning support tools. Through clear and structured explanations, lecturers help students develop the technical skills needed to participate effectively in digital learning activities. Such guidance can reduce potential technical difficulties, facilitate students' adaptation to digital learning environments, and support the development of learning independence and confidence in using technology for academic purposes.

Furthermore, lecturers provide digital feedback on students' learning outcomes through LMS platforms and other digital applications. This feedback may include comments on assignments, assessments, progress reports, and recommendations for improvement, enabling students to identify their strengths and areas requiring further development. Timely and constructive digital feedback can help students monitor their learning progress, understand the extent to which they have achieved the expected learning outcomes, and make appropriate adjustments to their learning strategies. By integrating digital feedback into the learning process, lecturers can support continuous improvement in students'

turnitin Page 20 of 23 - Integrity Submission Submission ID trn:oid:::1:3697646748

academic performance and digital competencies while fostering more interactive and responsive learning experiences in higher education. [21].

Continuous feedback provided by lecturers on students' learning activities and outcomes is a crucial component of digital competency-based learning. Through digital feedback, students receive detailed information about their strengths and weaknesses, along with specific recommendations for improvement. This process encourages self-reflection, enhances learning motivation, and promotes a culture of continuous learning. Constructive feedback also enables students to evaluate the effectiveness of their learning strategies, assess their use of digital learning resources, and strengthen their critical and analytical thinking skills. To provide a more comprehensive discussion, these theoretical perspectives should be supported by empirical evidence from classroom observations or interviews with lecturers and students. For example, observational findings may illustrate how lecturers use digital platforms to provide feedback on assignments, while interview data may reveal how students perceive and apply the feedback to improve their learning outcomes. Such findings would demonstrate the practical implementation of continuous feedback and its contribution to students' digital competency development. Consistent lecturer feedback can therefore encourage students to participate actively in the learning process, improve their academic performance, and develop independent and adaptive learning habits that align with the demands of the digital and professional environments [22].

Research findings indicate that the success of digital competency-based learning is strongly influenced by lecturers' digital pedagogical competence. Lecturers' ability to integrate content knowledge, pedagogical approaches, and technology, as described in the Technological Pedagogical Content Knowledge (TPACK) framework, is a key factor in creating effective and meaningful digital learning experiences. Evidence from interviews and classroom observations can further demonstrate this competence by illustrating how lecturers combine subject-specific content with appropriate teaching strategies and digital tools. For example, interview findings may reveal that lecturers select digital platforms based on learning objectives and student needs, while classroom observations may show how these platforms are used to facilitate interactive discussions, collaborative assignments, and digital information analysis. Such practices demonstrate the integration of content, pedagogy, and technology in actual learning activities. By applying TPACK principles, lecturers can design innovative learning strategies, adapt teaching methods to students' characteristics, and optimize digital technology to support the achievement of students' digital competencies. This competence enables lecturers to act as effective learning facilitators rather than merely transmitters of knowledge, encouraging students to participate actively, collaborate with their peers, and develop critical and creative thinking skills in digital learning environments [23].

However, the findings also revealed significant challenges in implementing a digital competency-based curriculum. One of the main challenges was the variation in students' digital literacy levels, as some students required more intensive guidance to effectively manage, evaluate, and utilize digital information. Furthermore, limited access to digital devices and unstable internet connections created additional barriers that affected students' participation and the quality of their learning experiences. To strengthen these findings,

turnitin Page 20 of 23 - Integrity Submission Submission ID trn:oid:::1:3697646748

turnitin Page 21 of 23 - Integrity Submission Submission ID trn:oid:::1:3697646748

quantitative data on the number of students experiencing access-related difficulties or qualitative evidence from interview excerpts should be incorporated, where available. These challenges indicate that the implementation of digital learning should not be approached uniformly but should instead consider differences in students' digital competencies, technological access, and individual learning needs [14].

To address these challenges, lecturers implement various flexible and adaptive learning strategies to accommodate students' diverse needs and levels of digital competency. These strategies include providing step-by-step tutorials on how to use the Learning Management System (LMS), distributing PDF guides that explain learning procedures, and sharing instructional videos to help students navigate digital learning platforms independently. Lecturers also offer alternative assignments for students who experience technical difficulties or have limited access to digital resources, as well as flexibility in assignment deadlines to accommodate individual circumstances. These measures demonstrate that the success of digital competency-based learning depends not only on lecturers' ability to respond to students' diverse needs but also on institutional support for inclusive, accessible, and adaptive learning processes [24].

4 CONCLUSION

The findings of this study indicate that the implementation of a digital competency-based curriculum in higher education is supported by structured instructional planning, the integration of digital competencies into learning outcomes, the use of digital learning materials and platforms, and the role of lecturers as facilitators who provide conceptual guidance, technical assistance, and continuous feedback. These practices contribute to creating a more structured learning environment and support the development of students' digital competencies, including information literacy, critical thinking, and online collaboration. However, the extent to which these practices improve learning outcomes requires further examination using appropriate empirical measures.

Based on these findings, lecturers are encouraged to continuously develop their digital pedagogical competencies and adopt technology-based learning strategies that align with students' learning needs. Students should be encouraged to use digital learning resources actively and responsibly to strengthen their information literacy, critical thinking, and online collaboration skills. Meanwhile, higher education institutions should provide adequate technological infrastructure and targeted capacity-building programs, including digital pedagogy training and learning management system (LMS) workshops for lecturers, as well as digital literacy training for students. These measures may help foster an inclusive, adaptive, and sustainable digital learning environment that supports students' academic and professional development.

This study has limitations that should be considered when interpreting its findings, particularly regarding the research context and the extent to which the results can be generalized to other higher education institutions. Therefore, future research should examine the implementation of digital competency-based curricula across different institutional contexts and academic disciplines. Further studies could also employ quantitative or mixed-methods approaches to assess changes in students' digital competencies and investigate the

turnitin Page 21 of 23 - Integrity Submission Submission ID trn:oid:::1:3697646748

turnitin Page 22 of 23 - Integrity Submission Submission ID trn:oid:::1:3697646748

relationships between curriculum implementation, teaching practices, and measurable learning outcomes. Such research would provide a more comprehensive understanding of the conditions under which digital competency-based curricula can effectively support higher education in the era of digital transformation.

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turnitin Page 22 of 23 - Integrity Submission Submission ID trn:oid:::1:3697646748

turnitin Page 23 of 23 - Integrity Submission Submission ID trn:oid:::1:3697646748

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turnitin Page 23 of 23 - Integrity Submission Submission ID trn:oid:::1:3697646748