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The Mapping of Digital Culture Among Higher Education Lecturers in Indonesia (A Multisite Study)

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Abstract: This study aims to analyze and construct a mind map of the digital culture of lecturers in higher education and its implications for the implementation of the Tri Dharma of Higher Education in the digital era. Using qualitative research with a multisite study design, data were collected through interviews, observations, and document analysis at IAIN Kendari and Universitas Muhammadiyah Kendari. The findings indicate that the digital culture of lecturers plays a crucial role in enhancing the effectiveness of teaching, research, community service, and faculty administration. Several key aspects were identified, including the development of digital competencies, innovation in teaching methods, and improved information accessibility among faculty and students. The study also revealed that despite progress in the adoption of digital technologies, challenges remain, such as insufficient training and resistance to changes in work culture due to digital transformation. Therefore, it is recommended that higher education institutions provide more intensive support for the development of digital culture and technological infrastructure. Thus, this research not only provides an overview of the digital culture of lecturers but also successfully constructs a mind map that simultaneously offers strategic recommendations for improving the quality of Tri Dharma implementation in the digital era.

Abstrak: *Penelitian ini bertujuan untuk menganalisis dan menyusun peta pikiran mengenai budaya digital dosen di perguruan tinggi serta implikasinya terhadap pelaksanaan Tri Dharma Perguruan Tinggi di era digital. Menggunakan pendekatan kualitatif dengan desain studi multisitus, data dikumpulkan melalui wawancara, observasi, dan analisis dokumen di IAIN Kendari dan Universitas Muhammadiyah Kendari. Temuan menunjukkan bahwa budaya digital dosen memainkan peran penting dalam meningkatkan efektivitas pengajaran, penelitian, pengabdian kepada masyarakat, dan administrasi fakultas. Beberapa aspek kunci yang diidentifikasi meliputi pengembangan kompetensi digital, inovasi dalam metode pengajaran, dan peningkatan akses informasi di kalangan dosen dan mahasiswa. Studi ini juga mengungkapkan bahwa meskipun terdapat kemajuan dalam adopsi teknologi digital, masih terdapat tantangan seperti kurangnya pelatihan dan resistensi terhadap perubahan budaya kerja akibat transformasi digital. Oleh karena itu, disarankan agar perguruan tinggi memberikan dukungan yang lebih intensif terhadap pengembangan budaya digital dan infrastruktur teknologi. Dengan demikian, penelitian ini tidak hanya*

memberikan gambaran mengenai budaya digital dosen, tetapi juga berhasil menyusun peta pikiran yang sekaligus menawarkan rekomendasi strategis untuk meningkatkan kualitas pelaksanaan Tri Dharma di era digital.
Keywords: Higher Education Institution, Digital Culture, Lecturers

INTRODUCTION

The emergence of digital technology, which has permeated all levels of education, has presented a challenge for higher education institutions to redefine the implementation of teaching and research, as well as to redesign the infrastructure they possess to ensure the availability of digital technology resources. (Weller & Anderson, 2013). Several research findings (Gabriel et al., 2012; Beetham, 2013) have shown that digital technology plays a crucial role and has become an integrated policy in the instructional learning process, effectively shaping students who are capable of facing various challenges in the 21st-century workplace. Research by Frontiers in Education reveals that integrating technologies such as artificial intelligence (AI) and virtual reality (VR) into education can enhance accessibility, engagement, and personalized learning, while also preparing students for the demands of the modern workforce (Zou et al., 2025). This finding is supported by studies on digital transformation in education, which highlight how tools like data analytics and AR/VR foster more interactive and adaptive learning environments (Mukul & Büyüközkan, 2023). Moreover, the flexibility of digital learning platforms enables students to access materials at any time, benefiting those with additional commitments such as work or family responsibilities. This flexibility contributes to improved information retention and academic performance (Zou et al., 2025). The application of educational technology can include the optimization of digital learning tools (Junaedi et al., 2022), the development of e-modules as digital resources (Daud et al., 2022), and the integration of technological elements with pedagogy to enhance writing skills (Herwanis et al., 2024).

On another aspect, higher education institutions play a crucial role in shaping a generation that is ready to face global challenges. In this modern era, digitalization has become a major driver of change across various sectors, including education. Therefore, the establishment of a digital culture in higher education is essential to ensure the sustainability and relevance of these institutions in the future. Several implications logically arise from the necessity for higher education institutions to implement digitalization policies. First, the enhancement of educational accessibility. Through online learning platforms, students can access course materials, complete assignments, and utilize other educational resources more flexibly. This is particularly important in the context of globalization, where students often come from diverse backgrounds and geographic locations. With a strong digital culture, learning can be accessed anytime and anywhere, providing more inclusive learning opportunities (Allen & Seaman, 2017).

Second, the development of digital competencies. Through the integration of technology into the learning process, students will be better prepared to meet the ever-changing demands of the job market (Quadrado et al., 2021). Digital culture also encourages more active student engagement in the learning process. Through online forums, virtual discussions, and collaborative projects, students can participate in interactive dialogue with fellow students and instructors. This not only enhances their understanding of the material but also sharpens the social and collaborative skills that are crucial in the professional world. (Salmon, 2013). The use of technology in education—such as online platforms, virtual simulations, and augmented reality—has contributed to more engaging and effective learning experiences. Technology enables

the development of teaching methods tailored to individual learning styles, thereby improving the overall quality of education. Research indicates that technologies like Virtual Reality (VR) and Augmented Reality (AR) not only increase interactivity but also enhance subject matter comprehension by presenting information in a more tangible and immersive manner (Sholeh et al., 2021). Furthermore, digital learning tools such as e-modules and interactive quizzes have proven effective in improving student understanding. Thus, the integration of technology in education not only enriches learning quality but also broadens access to both independent and collaborative learning opportunities.

Fourth, efficiency in higher education administration, where digital culture also has a positive impact on administrative efficiency. The use of learning management systems, online databases, and digital administrative applications can streamline processes such as student data management, registration, and evaluation. This helps reduce the administrative workload and allows for greater focus on improving the quality of teaching and learning (Wahyudi & Sunarsi, 2021).

Fifth, digital research and publication, where the digital culture of faculty members extends beyond teaching to include research and publication. Faculty members with a digital culture use online platforms to access research resources, collaborate with peers globally, and adopt digital publication practices. This broadens access to research information and supports cross-border scholarly exchange (Weller, 2011). Sixth, the development of community service tasks, where digital technology enables faculty members to develop applications and digital solutions that can provide direct benefits to the community. Examples include the creation of health applications, online education platforms, or information systems to support public services (Brion, 2019). Faculty members can also communicate more effectively with the community through social media, email, and other online collaboration platforms (Cogburn & Espinoza-Vasquez, 2011). Faculty members can even enhance their collaboration with the community through online collaboration tools, such as Google Workspace or Microsoft Teams (Baepler et al., 2014). From the aspect of information accessibility, faculty members can quickly access a variety of information sources, literature, and data through the internet, facilitating their research and the development of solutions for community issues.

The digital world presents significant opportunities and benefits for society, while also posing challenges to various aspects of life related to improving quality and efficiency. Society 5.0 is a societal technology concept that emphasizes the cooperation between humans and technological systems to solve social problems that are integrated in both the digital and real-world domains. In Society 5.0, humans are not merely objects of technology but the subjects who control the advancement of science and technology (human-centered society). Thus, in the era of Industry 4.0, society actively seeks, accesses, and analyzes information or data through online services in the virtual world. The development of digital technology can have a positive impact on the progress of a nation and create a digital society in response to the rapid development of digital technology over the past few decades (Rouf, 2019).

Currently, the academic community in higher education is also experiencing technological advancements that are easily accessible by anyone, anywhere, and at any time. Technological progress in the digital era is expected to simplify the tasks of students, lecturers, and administrative staff, making it easier for them to search for references and explore their potential to enhance understanding. The presence of technology in education brings numerous innovations that play a significant role in supporting the success of the learning process. Amid global demands to continuously adapt to technological advancements, the education sector,

including Islamic Higher Education Institutions (PTKI), must also undergo transformation. In the context of higher education implementation, academic culture can be realized in PTKI through the application of the Tri Dharma Perguruan Tinggi concept, which encompasses teaching, research, and community service through the utilization of digital technology (Supriyanto, 2021).

On the other hand, in the continuously evolving digital era, the role of lecturers in higher education has undergone a significant transformation. The digital culture of lecturers reflects the adaptation and integration of information and communication technology (ICT) into teaching practices, research, and interactions with students. This transformation supports the creation of a dynamic, innovative, and relevant learning environment that meets the demands of the times. The concept of digital culture for lecturers has been introduced by several educational experts. According to Adams Becker et al., (2018) The digital culture of lecturers can be identified as an attitude that includes openness to technology, readiness for continuous learning, and the integration of technology into teaching practices. Educational experts like Koehler et al. (2013) emphasize the importance of pedagogical content knowledge and technological pedagogical knowledge in shaping the digital culture of lecturers. Therefore, it can be concluded that the digital culture of lecturers encompasses the attitudes, habits, and expertise of lecturers in adopting and integrating digital technology within the academic environment. This digital culture involves an openness to using technology, a readiness for continuous learning, and the ability to integrate technology into teaching, research, and community service practices, along with other supporting elements.

Therefore, the digital culture of lecturers becomes a crucial foundation in supporting the transformation of higher education in the digital era. Lecturers who are able to adopt digital culture can create more innovative, adaptive, and relevant learning experiences. It is essential for educational institutions to provide the necessary support and resources so that lecturers can develop their digital skills and continue to contribute to the evolution of education in the future.

The discussion above highlights that, in responding to the opportunities of the digital age, fostering a digital culture in higher education is not merely a necessity but also a strategic investment in the future of education. Increased accessibility, the development of digital skills, innovation in teaching methods, more active student engagement, and administrative efficiency are some of the key aspects that highlight the urgency of digital culture. By understanding and adopting digital culture, higher education institutions can play a proactive role in preparing students to become future leaders who are adaptable to technological advancements and global changes. Thus, digital culture is not only a transformation of education but also the key to a brighter and more sustainable future. The digital culture for lecturers also serves as a critical foundation in supporting the transformation of education in the digital era. Lecturers who are able to adopt digital culture can bring about more innovative, adaptive, and relevant learning experiences. It is important for educational institutions to provide the necessary support and resources so that lecturers can develop their digital competencies and continue to contribute to the evolution of education in the future.

Various studies on digital technology for lecturers have been conducted, but they have not been comprehensive. For example, the optimization of information technology in improving lecturer performance (Muhajirin et al., 2023), The influence of digital literacy levels on lecturer productivity (Adriansyah & Rahmayati, 2023), The utilization of digital technology in the context of the COVID-19 pandemic (Solihin, 2023; Nastiti & Hayati, 2020), as well as the level of acceptance of digital technology by lecturers (Odora & Matoti, 2015). This indicates that there has been no comprehensive study on

the digital culture of lecturers in relation to the implementation of the Tri Dharma of Higher Education in Indonesia. The novelty of this research lies in its focus on two distinct research loci: the State Islamic Institute (IAIN) Kendari and Muhammadiyah University of Kendari (UMK). These institutions were selected to represent both types of Islamic higher education providers in Indonesia IAIN Kendari as the sole public Islamic higher education institution (PTKI Negeri) in the region, and UMK as a representative of private PTKIs. Moreover, this study presents a mind map of lecturers' digital culture in the implementation of the Tri Dharma of Higher Education an aspect that has not been examined in previous research.

The research questions addressed in this study are how the digital culture of lecturers manifests in teaching, research, community service, and faculty administration at IAIN Kendari and UMK. Additionally, this study is expected to build an ideal mind mapping of the digital culture of lecturers, which could serve as a decision making tool for university leaders regarding campus digitalization. This, in turn, will help establish a strong digital culture for lecturers, ultimately leading to an improvement in the quality of the implementation of the Tri Dharma of Higher Education.

Finally, this study successfully asserts a research novelty in the form of a mind map of digital culture for lecturers, which will help establish a strong digital culture among them, ultimately leading to an improvement in the quality of the implementation of the Tri Dharma of Higher Education.

METHOD

This research is a qualitative study with a multisite approach, aiming to explore in-depth data about the digital culture of lecturers in carrying out the Tri Dharma of Higher Education at IAIN Kendari and Muhammadiyah University of Kendari, which will then serve as the basis for constructing an ideal mind mapping of the digital culture of lecturers. Data were collected through two methods: closed interviews using Google Forms, and the data obtained through this technique were then explored and elaborated further through open interviews, observations, and documentation. The informants in this study totaled 53 individuals (originating from a diverse academic background), with the following description of the informants:

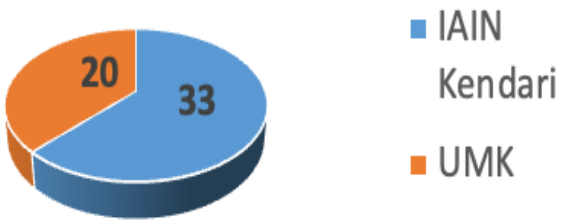

Figure 1: Origin of the Informants:

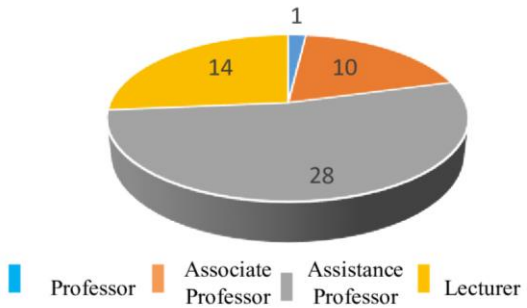

Figure 2: Academic Position of the Informants:

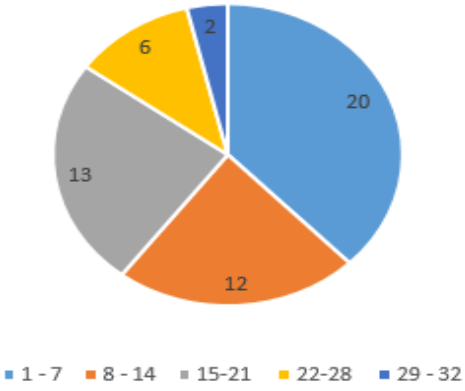

Figure 3: Work Experience of Informants

The data obtained were then validated using triangulation techniques, including source triangulation, technique triangulation, and time triangulation. The collected data were then coded to detect patterns emerging from the data. The collected data were first transcribed and repeatedly reviewed to ensure a thorough understanding. Subsequently, significant segments of the

data were assigned descriptive codes. These codes were then grouped based on thematic similarities and connecting keywords were identified to facilitate further analysis which were subsequently classified based on the identified patterns and analyzed through the following steps:

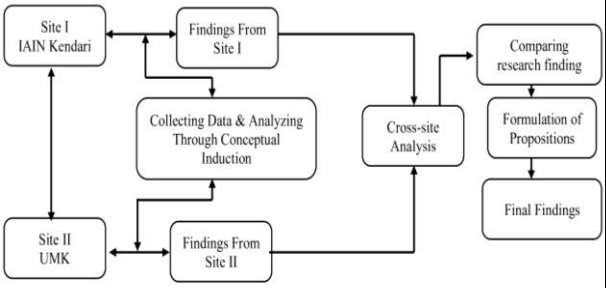

Figure 4: Data Analysis Process

RESULTS AND DISCUSSION

Various interesting findings were discovered in this study, as shown in the table below:

a. Teaching Field

Table 1. Digital Culture in the Teaching Field

No.	Aspect	Cross-Site Findings Analysis
1.	The forms of utilization of various digital technologies and applications to support lecturers' teaching duties.	Lecturers at IAIN Kendari and UMK exhibit similar patterns in utilizing digital technology to support teaching duties, ranging from student interaction to evaluation. The difference lies primarily in the lecturers' preferences and the availability of facilities at each institution.
2.	Digital Platforms Used in the Teaching Field	Both institutions emphasize flexibility, with IAIN Kendari focusing on the diversity of devices and learning styles, while UMK prioritizes remote access and support for external lecturer tasks by using WhatsApp Groups for quick communication.
3.	Preferences in the Use of Various Digital Platforms	Lecturers at IAIN Kendari prioritize flexibility, creativity, and innovation in selecting digital platforms to be used. In contrast, lecturers at UMK emphasize structure, efficiency, and accessibility of platforms.
4.	Intensity of Online Learning (E-learning)	IAIN Kendari implements online lectures with flexibility, while UMK uses them to overcome limitations in classroom space.
5.	Utilization of Digital Technology in Developing the RPS (Rencana Pembelajaran Semester)	Lecturers at IAIN Kendari focus on developing interactive materials and well-structured RPS (Semester Learning Plans) by utilizing digital media for collaboration. In contrast, UMK prioritizes a clear RPS structure, sharing RPS examples, and faculty discussions to enhance the efficiency and accessibility of materials..
6.	Utilization of Digital Technology in Developing Teaching Materials/ Lectures	Lecturers at IAIN Kendari make greater use of interactive media and gamification, utilizing Moodle and Canva for collaboration and visual content. Meanwhile, UMK focuses on a clear structure for teaching materials, using online quizzes and e-polling, with systematic management of content.
7.	Flexibility and Innovation in Teaching Strategies/Models	Lecturers at IAIN Kendari emphasize game-based learning, discussions, and problem-solving practices using interactive tools like Kahoot to enhance student interaction and creativity. In contrast, lecturers at UMK focus on collaboration, interactive simulations,

No.	Aspect	Cross-Site Findings Analysis	No.	Aspect	Cross-Site Findings Analysis
		and the use of digital tools for online discussions and collaborative projects, with assessments based on online quizzes and e-polling.		Guidance	technology for internship guidance, as both institutions use similar approaches to support students during their internships.
8.	Determining Learning Media	Lecturers at IAIN Kendari and UMK share a similar approach to learning media, using digital tools and training to enhance skills. The difference lies in consultation; IAIN Kendari involves technology experts for in-depth optimization, while UMK focuses on utilizing technology-based media.	12.	Conducting Community Service (KKN) Guidance	Lecturers at IAIN Kendari use a dedicated application (kkn.iainkendari.ac.id) to monitor students' daily performance reports, while UMK relies on WhatsApp groups and online guidance without a specific application. The mentoring at IAIN Kendari is more comprehensive, including creative economy products and scientific articles, while UMK only mentions guidance through WhatsApp groups without detailing specific outputs.
9.	Learning Evaluation	Lecturers at both IAIN Kendari and UMK utilize digital technology in learning evaluation, using online quizzes, portfolio assessments, data analysis, and collecting feedback through surveys and discussion forums. The difference lies in IAIN Kendari emphasizing discussion forums for general reflection, while UMK focuses on in-depth discussions. Despite small variations, both institutions share a similar approach in using technology for evaluation.	13.	Implementation of Thesis/Dissertation Supervision	There is no significant difference in the use of digital technology for thesis/dissertation supervision; both institutions apply technology in almost the same way across all aspects of guidance.
			14.	Implementation of Comprehensive Exams	Lecturers at IAIN Kendari are more consistent in using campus-specific applications, while UMK shows variation in technology use depending on individual lecturers.
10.	Transparency in Assessment and Providing Students with Opportunities for Self-Reflection	Lecturers at IAIN Kendari and UMK provide transparency in assessment by offering online access to results, criteria, and assessment rubrics. They also provide clarification spaces for students to discuss assessment outcomes.	15.	Building Collaboration with Lecturers from Other Higher Education Institutions to Enhance Teaching Quality	Lecturers from IAIN Kendari and UMK both enhance their professionalism through digital activities such as webinars and other virtual meetings. Both engage in collaboration and mentoring among lecturers, but UMK shows variation in participation, with some
11.	Implementation of Field Practice/Internship	There is no significant difference in the application of digital			

No.	Aspect	Cross-Site Findings Analysis
		lecturers not fully involved.
16.	Challenge/ Obstacle	The lecturers at IAIN Kendari and UMK face several digital challenges, including limited technological skills, device issues, restricted access, and concerns about the digitalization of education. IAIN Kendari shows a variation in technological skills, while UMK has a higher resistance to digital changes.

b. Research Field

Table 2. Digital Culture in the Field of Research

No.	Aspect	Analysis of Findings
1.	Finding Research Topics	Faculty members at IAIN Kendari and UMK use similar academic digital tools, such as search engines and collaboration platforms. While UMK shows a more comprehensive approach, both universities leverage digital technology to identify and follow current research trends.
2.	Identifying research gaps	Lecturers from IAIN Kendari and UMK use various digital sources for research. IAIN Kendari utilizes social media to identify research trends, while UMK focuses on collaboration platforms.
3.	Finding references	Both use identical digital tools for research references, which shows a uniform research strategy and adoption of digital technology.
4.	Situation Management/ References	The lecturers at IAIN Kendari and UMK utilize primary reference management tools such as Mendeley, Zotero, and EndNote.
5.	Finding and understanding the grand theory of research	Faculty members at IAIN Kendari and UMK have a strong approach to understanding the grand theory of research from digital sources, with UMK relying more on large academic databases, while IAIN Kendari explores theories through peer communication.
6.	Developing research methods	Both have the same readiness to face the digitization of research, reflecting the global trend of utilizing technology to enhance research accuracy.
7.	Assisting the research data collection process	Both adopt flexible tools that are suited to the research needs across various disciplines.
8.	Avoid plagiarism	Both use plagiarism checkers, manual paraphrasing, and AI to prevent plagiarism. UMK adds online consultations with research colleagues, while IAIN Kendari focuses on AI humanization to produce natural text.
9.	Assist in book writing	Both use AI and online collaboration in book writing. IAIN Kendari focuses on free applications and topic discovery through digital technology, while UMK emphasizes the collaborative process and the use of AI throughout the writing stages.
10.	Challenge/ Obstacle	Both face similar digital challenges, including information

No.	Aspect	Analysis of Findings
		quality, access limitations, sensitive data collection, researcher skills, knowledge updates, ethics, and data security.

c. Community Service Field

Table 3. Digital Culture in Community Service

No.	Aspect	Analysis of Findings
1.	Interaction Patterns	Both demonstrate a commitment to digital openness and accessibility, with IAIN Kendari placing more emphasis on partnerships and open collaboration. Both prioritize real-time interaction and media diversification for community engagement.
2.	The most frequently utilized online platforms.	Both utilize digital platforms for community service. IAIN Kendari focuses on social media for visual information, while UMK emphasizes websites, blogs, and mobile apps for interaction.
3.	Determining the platforms used	Both prioritize high-quality and relevant content, monitoring interactions and the impact of content, and being responsive to the needs of the audience.
4.	In managing scientific journals as part of community service tasks.	Both demonstrate similarities in the methods and platforms used to manage journals, with a focus on collaboration and efficient communication.
5.	Challenge/ Obstacle	Both face similar challenges regarding limitations in faculty capacity, funding, community participation, and data security. However, UMK also experiences additional obstacles related to infrastructure and technology access.

d. Field of Administration

Table 4. Budaya Digital Pada Bidang Pengajaran

No.	Aspect	Analysis of Findings
1.	Impact Felt by the Lecturers	Both experienced positive impacts, including increased efficiency and collaboration, but still face challenges in digital skills development.
2.	Administrative activities	
3.	In meeting administrative needs	Both show significant similarity in the use of applications for administration, reflecting similar standards and practices in digital culture.
4.	In managing administrative accounts.	Both show a similar approach in managing administrative accounts, focusing on understanding guidelines, simple credential management, and collaboration among colleagues.
5.	Challenge/ Obstacle	Both face challenges such as the large number of applications and accounts, which can overwhelm and confuse lecturers when accessing various platforms.
6.	Involvement of Others	Both frequently involve colleagues in fulfilling their administrative needs.

Based on various findings above so the research propositions can be formulated as follows:

1. If lecturers develop a digital culture in teaching activities by utilizing various digital platforms, it can create better interaction with students and enhance learning flexibility, which in turn impacts the quality of teaching and student engagement.
2. If lecturers maximize the use of digital resources to support research activities, such as utilizing Artificial Intelligence,

research databases, and collaboration platforms, it will lead to increased research productivity and collaboration among lecturers and institutions.

3. If lecturers adopt a digital culture in carrying out community service activities through social media and various digital platforms for information dissemination, interaction with the community, and activity documentation, it can increase community participation and extend the impact of the service to the wider community.
4. If lecturers utilize digital technology for academic administration processes, such as data entry, attendance management, and assessment, it can improve efficiency, data accuracy, and decision-making within the academic environment of higher education institutions.

Lecturers at IAIN Kendari have demonstrated a commitment to integrating technology into the teaching process. The use of various digital platforms, both provided by the campus and available on the internet, is a positive step toward enhancing teaching effectiveness. According to Georgina dan Hosford (2009), the integration of technology in teaching offers several benefits, such as improving accessibility to materials and providing flexibility in learning time. At IAIN Kendari, digital platforms serve as a means to deliver teaching materials and facilitate communication between lecturers and students. However, significant challenges arise regarding the variation in digital skills among lecturers. Wu dand Yuan (2023) noted that varying digital competencies among lecturers can hinder the successful integration of technology in education. Lecturers who are less skilled in using technology may not be able to fully utilize digital tools, which can ultimately reduce the quality of learning. Therefore, training focused on improving lecturers' digital skills is essential.

Facing this challenge, lecturers need to implement diverse and focused training programs. These programs should include the use of Learning Management Systems (LMS), collaborative tools such as Google Classroom or Zoom, as well as innovative teaching techniques. Research by Ertmer and Leftwich (2010) shows that effective training can enhance lecturers' confidence in using technology, thereby improving the student learning experience.

On the other hand, lecturers must also adjust their pedagogical strategies to integrate various digital tools in order to enhance teaching effectiveness and student engagement (Vieira & De Oliveira, 2024). Through continuous training, it is expected that lecturers will be able to develop their professionalism consistently, enabling them to keep up with technological advancements and evolving pedagogical practices (Pacheco; & Cerutt, 2017). Lecturers can also apply innovative teaching methods such as blended learning and flipped classrooms. These approaches offer flexibility in how students access materials and engage in the learning process. Akçayır and Gökçe (2018) state that the flipped classroom allows students to interact with the material independently before engaging in more in-depth learning in the classroom. This way, lecturers can focus on direct interaction and discussions in class.

Similarly, lecturers who are actively creating an interactive and collaborative learning environment have been shown to improve academic outcomes and student motivation (Johnson et al., 2014). his approach is particularly important given the limitations of available classroom space. Lecturers strive to utilize technology to support interaction among students by using tools such as discussion forums, video conferences, and online group projects. The more active use of technology in teaching aims to enhance student engagement. Wang and Michael (2011) argue that student engagement can be improved with the appropriate use of technology, making the teaching material more engaging and relevant.

Meanwhile, digital culture is crucial for lecturers to navigate the increasingly

digital landscape of education and encourage "digital citizenship" behaviors among students (Leontyeva; et al., 2022). Digital citizenship refers to the understanding and skills necessary to participate safely, ethically, and responsibly in the digital space. For students, digital citizenship includes several key components, such as access and participation, digital ethics, digital security, effective online communication, critical thinking and information evaluation, and participation in digital communities. These elements are expected to help students play an effective and responsible role in an increasingly digitally connected world (Cuevas Lopez & del Arco Bravo, 2019).

In the context of research, the adoption of digital technology by lecturers is explained by Rogers (2014) emphasizes that the adoption of innovations is influenced by various factors, such as relative advantage, compatibility, complexity, and observability. Relative advantage refers to the degree to which an innovation is perceived as being better than previous practices. Compatibility is the extent to which an innovation aligns with existing values, experiences, and needs. Complexity refers to how difficult an innovation is perceived to be to understand and implement. Observability reflects the extent to which the results of the innovation are visible and can be evaluated by users. Thus, the factors outlined by Rogers in the innovation adoption theory play a significant role in research practices at IAIN Kendari and UMK, where faculty members at both institutions not only follow global trends in digital technology usage but also understand and adopt the appropriate tools to enhance the quality and collaboration in their research. Temuan ini sesuai dengan The research by Aithal (2023) found that the use of technology, especially artificial intelligence, in research accelerates data collection and improves the quality of research outcomes.

Online collaboration among researchers, as articulated in Weller's (2011) concept of The Digital Scholar, significantly enhances creativity and innovation by enabling the exchange of ideas and broadening access to diverse resources. This collaborative environment fosters the sharing of varied perspectives, contributing to a more comprehensive understanding of research problems and encouraging innovative solutions. Engagement through digital platforms also facilitates the identification of gaps in existing literature and the exploration of new research directions. Recent studies highlight that such collaboration improves research quality and productivity. For example, a review by Ali et al., (2022) demonstrates how digital tools enhance communication and collaboration among scholars, showing that shared knowledge and interdisciplinary expertise contribute to more robust research outcomes. Integrating Weller's framework with these contemporary findings underscores the transformative potential of online collaboration, cultivating an academic landscape that promotes deeper creativity and more impactful contributions.

On the other hand, the importance of maintaining originality and academic integrity in research ethics is highly relevant in the current academic world. Research ethics encompasses various aspects, including intellectual honesty, transparency in methodology, and acknowledgment of others' contributions. According to Mittal et al., (2024) Understanding plagiarism and research ethics is crucial in higher education because it impacts not only the reputation of individual researchers but also the credibility of academic institutions as a whole. When plagiarism occurs, not only is the originality of the research questioned, but the integrity of the academic community is also compromised. In an increasingly digitalized world, it is easy to plagiarize others' work, sometimes without even realizing it. Therefore, having a deep understanding of what constitutes plagiarism is essential for both students and especially for faculty members. Ljubovic & Pajic (2020) states that many academics are not fully aware of the norms and practices that can be considered

plagiarism, whether in paraphrasing ideas or directly copying texts. Without sufficient understanding and commitment to these ethics, there is a risk of making mistakes that could have serious consequences for a faculty member's academic career.

In the field of community service, a commitment to openness and accessibility in community-based education can create a more inclusive and responsive environment, which is crucial in social development. This is as stated by Garrison & Arbaugh (2007) and Shea et al., (2020) who emphasized that community engagement in higher education should involve better access to resources and information, as well as opportunities for direct interaction with researchers to achieve more significant impact. Lecturers at IAIN Kendari involved in community service programs focused on education and training reflect a more traditional approach, but this highlights the importance of integrating technology into the social and religious environment. According to Bennett and Maton (2010) The integration of digital technology in education, especially in the context of community service, can enhance connectivity and expand the reach of interactions with communities in need. However, as outlined in this study, there is still a demand for more initiative in accommodating the needs of the community, which remains a common challenge faced by institutions in reaching and engaging all segments of society.

In the field of administration, although not part of the three pillars of higher education, it is inseparable from the academic activities of lecturers. Research findings indicate that consistent use of technology has a significant impact on efficiency, accessibility, collaboration, and flexibility, which are key aspects that enhance lecturers' productivity. In managing administrative accounts, lecturers focus on understanding guidelines, simplifying credential management, and collaborating with colleagues.

Meanwhile, based on the Digital Culture Framework theory, digital culture has four main dimensions: technology, behavior, values, and practices (Mohebi, 2019). The research findings confirm the existence of these dimensions in the context of faculty administration: 1) The technology dimension includes the use of integrated information systems, the implementation of digital platforms, and the automation of administrative processes; 2) The behavior dimension involves adaptation to new systems, digital-based work patterns, and virtual collaboration; and 3) The values dimension includes efficiency and effectiveness, process transparency, and digital accountability. On another aspect, in line with the diffusion of innovation theory, the adoption of technology in administration follows a predictable pattern (Menzli et al., 2022) The research findings show that faculty can be categorized into several groups, namely: 1) Late Majority, faculty who adopt after the majority of their peers have already adopted digital tools; 2) Early Adopters, faculty who quickly adopt once they see the benefits; 3) Innovators, faculty who actively seek out and adopt new technologies; 4) Laggards, faculty who resist change.

The emergence of the above categorization, when referring to the technology integration model, can be influenced by several factors, including adequate technology infrastructure, institutional support, ongoing training, reward systems, resistance to change, limited digital competencies, system complexity, and administrative workload (Dysart & Weckerle, 2015; Akram et al., 2021). Meanwhile, the research by Kumar et al. (2023) shows that digital culture has a significant impact on administrative performance. These findings align with research outcomes that demonstrate improved administrative efficiency and productivity among faculty members through the use of digital technology as a form of their digital culture. Based on the Digital Maturity Model, several recommendations can be implemented to develop the digital culture of faculty members, such as the

development of systems in the form of simplification, system integration, and automation of routine administrative tasks. Human resource development could include digital certification programs, ongoing training, and a reward system (Đurek, 2019; Palacios Osma et al., 2021; Merzlov & Shilova, 2022).

Based on the various descriptions above, the digital culture of faculty members can be conceptualized as a manifestation of behavioral transformation, work patterns, and competencies of lecturers in higher education as they face the era of digitalization. This transformation encompasses four main integrated dimensions: teaching, research, community service, and administration. Each of these dimensions undergoes significant evolution, requiring continuous adaptation and development of digital competencies. In the teaching dimension, faculty members are required to adopt technology-based teaching approaches. The development of learning materials is no longer limited to conventional textbooks but has evolved into more dynamic and interactive digital content. E-books, video tutorials, and multimedia materials have become integral parts of faculty teaching activities. The ability to create and manage high-quality digital content has become an essential competency for lecturers.

Lecturers are also required to master various features of Learning Management Systems (LMS) as the primary platform for digital learning. This includes the ability to: 1) Design an effective online learning structure; 2) Develop interactive learning activities; 3) Manage virtual discussion forums; 4) Create and manage online assessments; 5) Monitor student progress and participation; and 6) Integrate various digital learning media. Digital culture has also transformed the way lecturers assess learning. The use of digital assessment tools allows for: 1) Automation of the assessment process; 2) In-depth analysis of learning outcomes; 3) Faster and more structured feedback; 4) Real-time tracking of student progress; 5) Implementation of adaptive assessments; and 6) Use of digital assessment rubrics. Lecturers also need to develop the ability to create engagement in the digital learning environment through: 1) Facilitating productive online discussions; 2) Using digital collaboration tools; 3) Implementing active learning in a virtual context; 4) Developing technology-based student-centered learning; 5) Integrating social learning platforms; and 6) Utilizing gamification elements.

The digital culture in the research dimension has transformed the way lecturers conduct research, including: 1) The use of data analysis software; 2) Implementation of digital research methods; 3) Utilization of big data analytics; 4) Use of AI and machine learning in research; 5) Implementation of digital data collection tools; and 6) Development of digital-based mixed-methods research. The transformation due to digital culture also affects research collaboration, with lecturers being required to participate in digital research networks, manage virtual research teams, use collaborative research platforms, share research resources digitally, organize virtual research meetings, and manage project management tools for research. Additionally, in the aspect of research publication, digital culture has changed how lecturers disseminate their research findings through electronic journal publications, virtual conference presentations, use of research social networks, utilization of academic social media, development of digital research repositories, and implementation of open access publishing.

In the dimension of community service, the digital culture of lecturers is reflected in the development of new approaches through the use of crowdfunding platforms to support community empowerment programs, implementation of social media campaigns, development of community engagement platforms, management of virtual community networks, conducting online public lectures, and fostering digital social innovation. As a

result, digital culture has encouraged lecturers to develop online workshops and webinars, create educational digital content for the community, manage virtual learning communities, implement mobile learning solutions, develop microlearning modules, and utilize social learning platforms. Therefore, lecturers need to develop the ability to: 1) Measure program impact digitally; 2) Use analytics tools for program evaluation; 3) Implement digital feedback systems; 4) Conduct social impact measurement; 5) Manage digital reporting systems; and 6) Develop data-driven improvement strategies.

The digital culture in the administration dimension is reflected in big data and analytics, which have revolutionized higher education administration management. The decision-making process, which is based on data analysis, has evolved to become more complex, sophisticated, and detailed, allowing for trend predictions, pattern identification, and optimization of available resources. Analytics tools help track various educational metrics, from student performance to resource utilization. Feedback systems for continuous improvement have become more systematic and measurable. Digital tools for management and communication between faculties have improved coordination and collaboration among academic stakeholders. Digital communication platforms have also facilitated more effective information dissemination, faster decision-making, and better coordination among faculties, institutions, and university units. To better understand the concept of the mind mapping of lecturers' digital culture, the diagram below illustrates it:

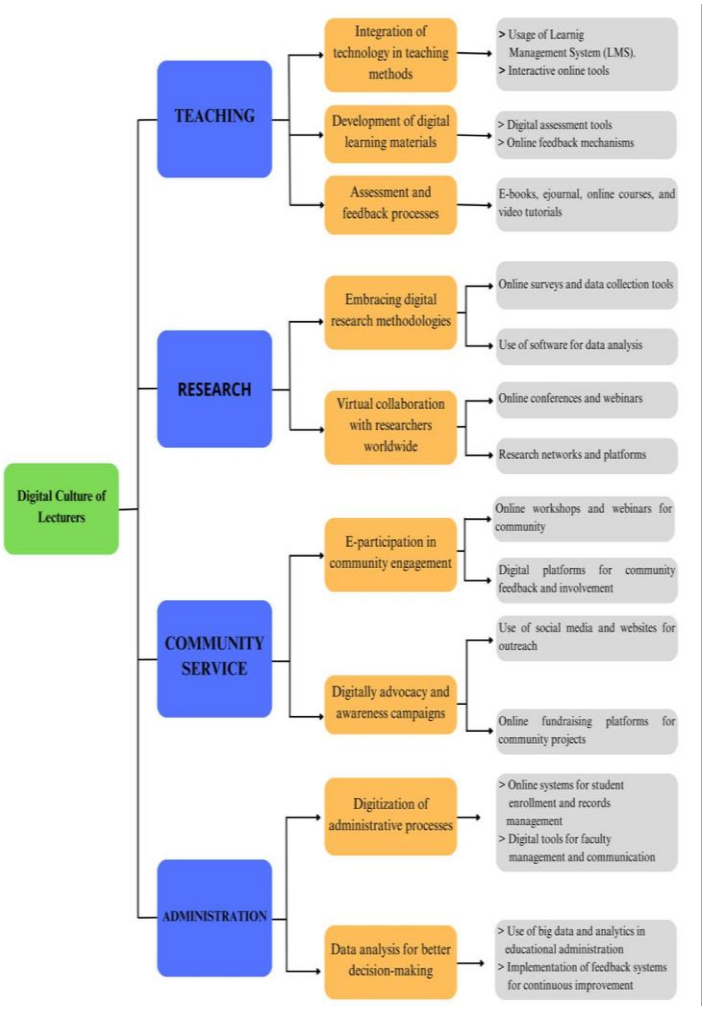

Figure 5: Digital Culture Mind Mapping for Lecturers

This research emphasizes that the digital culture of lecturers has fundamentally transformed the landscape of higher education. This transformation is not merely about technology adoption, but also a comprehensive change in mindset and working methods. Success in this digital era requires adaptability, continuous learning, and a strategic vision in integrating technology to achieve higher educational goals. Moving forward, the evolution of digital culture will continue, driven by technological innovation and changing societal needs. Lecturers must continuously develop their digital literacy and adaptability while maintaining the essence of the human touch in education. The balance between digital transformation and human values will be the key to creating a more effective, inclusive, and sustainable higher education system.

CONCLUSION

The digitalization of higher education can be seen in the digital culture that has transformed how lecturers carry out the tri dharma (threefold duties) of higher education. In the teaching dimension, lecturers are required to integrate technology into learning, develop digital learning materials, and build digital-based assessment and feedback processes. In the research dimension, there is a transformation in research methodologies, which includes the integration of digital technology across all stages of research. Lecturers are also expected to participate in digital research collaborations and networks, manage research teams virtually, and use research collaboration platforms. The publication of research results is now carried out through electronic journals, virtual conferences, and academic social networks. In the community service dimension, new approaches have been developed through the use of crowdfunding platforms to support community empowerment programs, implementation of social media campaigns, development of community engagement platforms, management of virtual community networks, online public lectures, and the development of digital social innovations. In the administration dimension, big data analytics has revolutionized university management by enabling data-driven decision-making that is more complex, to predict trends and optimize resources. It is recommended that higher education institutions organize training to enhance lecturers' digital competencies, invest in technology infrastructure, and form communities of lecturers to share experiences in implementing technology. Further research is needed to measure the impact of digital culture on the quality of education, including comparative studies between public and private universities in various regions to map the factors influencing technology adoption. It is also necessary to examine the long-term impact of implementing digital culture in teaching and research through quantitative analysis of academic performance and student skills improvement. The limitations of this study are that the research was conducted at only two university, the number of informants could be increased, and there is the potential for digital bias.

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