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ANALYSIS OF THE DIGITAL DIVIDE IN THE UTILIZATION OF ELECTRONIC LEARNING RESOURCES IN HIGHER EDUCATION ENVIRONMENTS

Riyan Sanjaya[1], Maydi Aula Riski[2], Matin[3], Alisya Kharima Abdillah[4], Yesicha Viona Militya Munthe[5]

[12345]Universitas Negeri Jakarta

Coressponding Author. E-mail: riyan.sanjaya@unj.ac.id

ABSTRACT

This study analyzes the digital divide in the utilization of e-journals among students at Universitas Negeri Jakarta (UNJ). A qualitative method was employed through in-depth interviews with 45 students from various faculties. The results reveal that although access to e-journals has been provided through subscriptions to premium platforms, the actual utilization rate remains very low only 18% of students have ever used them, and 6.7% are active users. The findings identify a multidimensional digital divide, particularly in the aspects of skills (58% of students faced technical difficulties) and motivation (47% of students preferred alternative platforms). Analysis using the UTAUT theory uncovered barriers in performance expectancy, effort expectancy, social influence, and facilitating conditions. Disparities in usage were also evident across faculties, indicating the need for discipline-specific approaches. This study recommends comprehensive strategies, including simplifying technical access, integrating digital literacy into the curriculum, enhancing massive socialization, and expanding relevant collections. The implementation of these strategies is expected to support the transformation of UNJ library services toward inclusive and empowering digital services.

Keywords: Digital Divide, Digital Inclusion, Digital Literacy, E-Journals, Higher Education

INTRODUCTION

Transformation of *Education 4.0* To *Education 5.0* marking a shift in focus from technological dominance towards a more human-centered and sustainability-oriented education, with the aim of realizing humanist learning and supporting development *Society 5.0* (Chinchorkar, S., & Jadhav, J., 2024). Universities are not only required to produce graduates who master theoretical concepts, but also those who have comprehensive digital skills to adapt to the dynamics of a knowledge-based society (Oliveira & Souza, 2022). In this context, e-learning resources such as e-journals, e-books, academic databases, and institutional

repositories have evolved from mere complements to central components in the modern learning ecosystem. In fact, UNESCO emphasizes that the digital horizon of Education 4.0 includes: reasoning of complexity, access to open platforms, digital support, new creations, and solidarity, in order to realize inclusive educational spaces and transformative formation processes through the integration of open digital technologies (Ramírez-Montoya et al., 2022).

However, behind the optimism of this digital transformation, there is a complex paradox hidden. The ease of access promised by technology is often buried by the reality of the digital divide (Chowdhury, 2002). A review of previous studies reveals the consistency of findings about the complexity of the digital divide in the higher education environment. A comprehensive study by Research conducted by P. K. Singh & Gangopadhyay (2017) examine the digital divide among students and researchers in universities and the role of academic libraries in bridging these gaps. The results of the study show that many students and researchers are still classified as *Digitally Poor* due to the limitations of computer literacy, access to technology, and information search ability, which ultimately hinders their personal and professional development.

Meanwhile, Octaviano (2020) researching the digital divide in the rural community of Argosari Village, Lumajang, by highlighting the influence of demographic factors such as age, education level, technological skills, and language understanding on the use of ICT devices. The results showed that although most of the respondents already had devices such as *Smartphone*, the ability to utilize technology and understand digital content, especially English-speaking, is still low due to limited infrastructure and digital literacy.

Research by Umar et al., (2025) examine the digital gap in the use of the iPusnas digital library application by students of the "Veteran" National Development University Jakarta. With qualitative methods, the results of the study show that most students do not know or utilize the iPusnas application even though they have adequate equipment and access to technology, so more intensive socialization and training are needed to improve digital literacy and the use of electronic resources.

From the three previous studies, it can be concluded that the digital divide is still the main obstacle in the use of digital technology and information resources, both in the general public and higher education. The main factors that cause this include limited digital literacy, technological infrastructure, and lack of optimal use of electronic learning resources. However, previous studies have emphasized more on the aspect of technology access and ICT use behavior in general, while the research entitled "Digital Gap Analysis in the Utilization of Electronic Learning Resources in the Higher Education Environment" focuses specifically on an in-depth analysis of the digital divide that affects the use of electronic learning resources (*e-learning, e-library, e-journal*, etc.) by students and lecturers in the university environment. Thus, this research is present as a differentiator by highlighting the academic and pedagogical dimensions of the digital divide, not only the issue of access to technology, but also how these gaps have an impact on the process and quality of learning in the digital era.

Initially, the digital divide was only understood as the gap between physical access to devices and internet connectivity (*First-level digital divide*). However, recent research suggests that the problem has shifted significantly to a deeper and more difficult to overcome gap, namely at the level of skills and utilization (*Second-level digital divide*). This is in accordance with the research by Jayanthi & Dinaseviani (2022) that the digital divide in Indonesia is not

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only caused by limited access and infrastructure, but also by the low digital ability of people to utilize technology productively. Van Dijk in his causal model describes the relationship between four conditions, namely: (1) personal inequality and categorical positions (gender, age, ethnicity, education level, employment status, and so on); (2) resource distribution; (3) types of phased access to ICT; and (4) participation in the community (Kamal Ahmed Soomro et al., 2018). This is reinforced by research Fadilla (2020) that the digital divide in the era of the fourth industrial revolution shows that there is an inequality in access to and use of ICT based on factors of age, gender, region, and work environment, so that libraries have an important role in utilizing technological developments to expand access to information for people affected by the digital divide.

The complexity of this digital divide is increasingly felt in the context of Indonesian higher education, including at the State University of Jakarta (UNJ). As one of the leading Educational Personnel Education Institutions (LPTK) located in the nation's capital, UNJ has a highly heterogeneous student population, reflecting Indonesia's socio-economic, geographical, and cultural diversity. In addition, because UNJ is located in DKI Jakarta which is the province with the city with the lowest digital dividend of other provinces (Ariyanti, 2013). Other studies show that there is a gap between actual and ideal conditions in the use of learning media, especially related to low learning motivation, difficulty in understanding the material, and the limitations of media that are still in the form of simple presentations (Arthur et al., 2019).

This diversity according to Rogers' theory of diffusion of innovation in Widaswara & Pramana (2022) has the potential to create wide variations in terms of readiness, adoption, and utilization of technology for learning. Research on the theory of diffusion of innovation by Mailin et al. (2022) It shows that the innovation adoption process occurs through five stages, namely knowledge, attitude formation, decision, implementation, and confirmation. These five stages will determine whether the community will accept or reject an innovation based on the benefits, suitability, and perception of the information received.

Although institutions have invested heavily in providing subscription access to various international journals and digital platforms, adequate facilities alone do not guarantee optimal, equitable, and meaningful utilization. Quantitative research by Maulidya & Arief (2023) with this statistical descriptive approach analyzing the use of EBSCO databases in a Library shows that although e-journal and e-book subscriptions are financially profitable, the level of efficiency of use is still low, i.e. only 6% of the total journals accessed. In addition, in the citation, students do not cite many journals, this is based on research by Istiana & Purwaningsih (2016), he conducted a citation analysis of UGM students' theses revealed that most of the information sources used are in the form of books and journals, where 64% of the cited journals can be accessed through library e-journal subscriptions, while the other 36% are not yet available.

By using the Model *Unified Theory of Acceptance and Use of Technology* (UTAUT) is a critical determinant that can widen or narrow the digital gap among students. The UTAUT model was developed to understand and explain how user behavior is formed in receiving and using information technology (Venkatesh et al., in Purnomo, 2019). The research using a simple model from UTAUT shows that students of Universitas Muslim Indonesia Makassar have a high level of expectations and usage behaviors on the platform *Digital Library Specific*

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Research, which serves to provide electronic access to various sources of information and digital library materials (Aryadi, 2023).

More specifically, e-journals as a source of primary information and the backbone of academic research are sensitive indicators to measure the depth of this digital divide, considering the low level of e-journal utilization in various higher education institutions due to limited training, awareness, and technological infrastructure (Acheampong et al., 2019). Research by Zaky & Naufal (2017) at Brawijaya University uses the framework *Technology Acceptance Model* (TAM) and *Information System Success* (ISS) to analyze student behavior in using e-journals, and the results show that user satisfaction and intention to use have a significant effect on the actual use of e-journals, which are influenced by information quality, perception of convenience, perception of usability, and attitude towards the use of technology.

This research intends to fill the gap in previous research by focusing on a phenomenological approach to understand the meaning and subjective experience of UNJ students as a representation of urban universities in Indonesia, while integrating empirical forging from various previous studies into a comprehensive theoretical framework. By focusing on the perspectives and *lived experiences* of users, this study aims to: (1) map the form of digital gap in each dimension in the Van Dijk model (motivational access, materials, skills, and use), (2) identify the psychosocial and institutional factors that are the root causes of these gaps, by referring to the UTAUT framework and digital literacy theory, and (3) formulate the implications strategic for the development of inclusive and contextual library policies and digital literacy programs. Based on this, this study will also design an intervention model that is specific to the UNJ context. The findings of this study are expected not only to make a theoretical contribution in contextualizing the theory of digital divide in the Indonesian higher education setting, but also to provide an operational roadmap for UNJ and similar universities in accelerating equitable digital transformation and empowering the entire academic community.

The digital divide has become a critical social and educational issue because it directly affects the equity, inclusion, and quality of learning outcomes in the digital age. Socially, these disparities reproduce and deepen existing structural inequalities. Individuals from low socio-economic backgrounds, remote areas, or certain vulnerable groups are increasingly at risk of being left behind because they cannot access, master, or utilize technology for social mobility, economic participation, and civic engagement. In the context of higher education, the digital divide can actually be a barrier. This creates an inequality of opportunity among students: some are able to tap into rich digital resources for research, collaboration, and self-development, while others are limping due to limited access, skills, or support. If not addressed, this situation has the potential to produce graduates with unequal digital competencies, which ultimately widens the gap between inequality in the world of work and *the knowledge society*. Therefore, understanding and overcoming the digital divide is not just a technical-pedagogical matter, but an ethical and strategic imperative to build a more equitable, inclusive, and empowering future of education for the entire academic community.

RESEARCH METHODS

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This study uses a descriptive qualitative approach to deeply understand the forms and factors that affect the digital divide in the use of electronic learning resources among users of the State University of Jakarta (UNJ). This approach was chosen because it is appropriate to explore the views of people who conduct, participate in, or read and review a study (Creswell & Miller, 2000). This research was carried out at the State University of Jakarta (UNJ) during the period from April to August 2025.

The research procedure is described as follows. The main source of data in this study is users, namely active UNJ students from various faculties. A total of 45 students were selected as participants using the*purposive sampling*to obtain rich and in-depth information from individuals who are considered to know best and experience the phenomenon being researched Purposive sampling is a nonprobability sampling technique that researchers use to select subjects from a population, although it has limitations of subjectivity and a lack of good representation, but is useful when randomization is not possible such as in large populations, limited resources, or research does not aim to generalize to the entire population (Eric, 2016). Participant selection criteria include faculty diversity, year of admission, and intensity of library use. In addition, source triangulation was carried out by interviewing 1 (one) librarian who is on duty in electronic source services as a key informant to obtain other perspectives and validate findings from interviews with students.

The data collection technique used was in-depth interviews (*in-depth interview*) with a semi-structured interview guide. This technique allows researchers to explore participants' experiences, constraints, motivations, and actual abilities in accessing and utilizing electronic learning resources, especially e-journals. The questions in the interview guide were developed based on the dimensions of Digital Gap Theory Van Dijk (2017) which includes aspects of material access, digital skills, and utilization. Each interview was recorded with the permission of the participant, then transcribed verbatim for analysis.

The data analysis technique applied is thematic analysis in accordance with the framework developed by Braun & Clarke (2006). This analysis process includes several stages: (1) familiarization with the data through repeated reading of transcripts; (2) generating initial codes; (3) searching for themes; (4) reviewing themes; (5) defining and naming themes; and (6) producing the report. This process is carried out to identify the main patterns (themes) that answer the formulation of the research problem. To maintain the validity of the data, source triangulation is carried out (comparing data from students and librarians) and member check (re-ensuring the interpretation of the researcher according to the intention of the participants)

RESULTS AND DISCUSSION

Results

The findings of this study provide solid empirical evidence to confirm and at the same time expand the theory of the digital divide Van Dijk (2017) in the socio-cultural context of Indonesian higher education. The results of the study revealed that at UNJ, although material access to e-journals has been guaranteed through subscriptions to premium platforms such as EBSCO and Emerald, the gap is even deeper at the psycho-social and cognitive levels. This pattern is consistent with the findings van Deursen & van Dijk (2019) The study on a representative sample in the Netherlands, which is a developed and wealthy country, proves that the first-level digital divide (physical and material access problems) still exists and

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continues to affect inequalities in skills and internet usage outcomes. However, this study managed to identify specific nuances in the Indonesian context where cultural and pedagogical factors play a more significant role.

The motivational gap identified in 47% of students indicates a fundamental problem in *value perception* of e-journal services. Students' preference for external platforms such as Google Scholar is not just a matter of habit, but reflects the failure of institutions to articulate compelling *value propositions*. The perception of incompleteness of the collection expressed by one of the students of the Faculty of Engineering (FT) about "the available e-journals are not as searched" needs to be read as a constructive criticism of the relevance of the content and alignment with specific academic needs.

The skills gap that hit 58% of students reflects a structural digital literacy crisis. The technical inability to operate the e-journal system expressed by one of the Faculty of Psychology Education (FPSI) about the ignorance of "how to access it, how to use it" shows that the provision of infrastructure alone is not enough without being accompanied by systematic *capacity building*. These findings reinforce the findings of Syabaruddin, A., & Imamudin, I. (2022) digital literacy is not just a technical ability but also the mastery of complex cognitive skills.

Through the theoretical lens *of the Unified Theory of Acceptance and Use of Technology* (UTAUT), the barriers to e-journal adoption at UNJ can be deconstructed analytically. The *performance expectancy* factor is hampered by students' perception of inferiority in the quality and quantity of content compared to external sources. *Effort expectancy* is hampered by the complexity of the interface and the high cost of cognitive transactions in the authentication process. *Social influence* is weakened due to the absence *of role modeling* from lecturers and peers. Meanwhile, *facilitating conditions* are not optimal due to limited supporting infrastructure and adequate *guidance systems*.

Findings regarding variations in utilization between faculties reveal disciplinary gaps in the academic digital ecosystem. The dominance of users from the Faculty of Engineering and the Faculty of Mathematics and Natural Sciences (FMIPA), along with the marginalization of users from the Faculty of Education (FIP), Faculty of Language and Arts (FBS), Faculty of Sports and Health Sciences (FIKK), and Faculty of Social Sciences and Law (FISH), indicate disciplinary bias in content development and engagement strategies. The statement of one FBS student that "the appearance is not in accordance with the content of the physical journal form in the library, so it is not complete" needs to be understood as a representation of the incompatibility between the needs of specific disciplines and the design of the available services.

From the perspective *of governance* and service management, the research findings reveal *deficiencies* in the information dissemination system and engagement mechanism. The fact that only 8% of students know about e-journals through the library's official channels shows the failure of institutional communication strategies. This condition requires a paradigmatic reorientation in a more participatory and *user-centric approach to engagement*.

In the context of inclusive urban education, the findings of this study highlight the urgency of transforming library service models that are responsive to the heterogeneity of user characteristics. The uniform approach that has been applied so far has proven to be ineffective in answering the complexity of different needs between faculties and levels of study. The need

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to customize services based on user personas is a strategic imperative to ensure the principle of equity in digital transformation.

The policy implications of these findings are multidimensional and require an integrated approach. At the technological level, intuitive interface redesign and simplification of the authentication process are required. At the educational level, the integration of digital literacy in the curriculum is a must. At the social-institutional level, more synergistic collaboration with lecturers and student organizations is needed. Meanwhile, at the collective level, the expansion of access to more relevant and quality resources is absolutely carried out.

In the future, the transformation of the UNJ library must be based on the philosophy of *equitable access*, *meaningful participation*, and *transformative learning outcomes*. This means not only guaranteeing the availability of digital resources, but also ensuring that every student regardless of socio-economic background, digital ability, or discipline has equal agency and opportunity to utilize them transformatively. The success of this transformation will be the main determinant in positioning UNJ as an institution that is able to lead innovation in the Indonesian higher education ecosystem in the era of digital disruption.

Discussion

The findings of this study provide strong empirical confirmation while enriching theoretical perspectives on the digital divide in the context of Indonesian higher education. A comprehensive analysis of data from 45 UNJ students not only validates van Dijk's theory of digital divide, but also reveals specific new dimensions in Indonesia's socio-cultural setting. The results show that although UNJ has allocated significant material resources to subscribe to reputable e-journal platforms such as EBSCO and Emerald, the gap is more pronounced in terms of user capabilities and motivation. This pattern is consistent with the findings Scheerder et al. (2017) that digital gap research is still limited to sociodemographic factors and needs to shift the focus to socio-cultural determinants as well as third-level disparities (tangible outcomes of internet use) to comprehensively understand how the benefits of the internet are distributed.

The motivational gap identified in 47% of students reveals a profound problem in the academic digital ecosystem. Students' preference for external platforms such as Google Scholar is not just a matter of habit, but reflects a systemic failure in building a competitive value proposition. The perception of the incompleteness of the collection expressed by one FT student about "the available e-journals not being what is sought" needs to be understood as a substantive criticism of the relevance of the content and alignment with specific academic needs. Furthermore, this phenomenon indicates a gap between user expectations and the reality of the services offered that require a holistic approach in content curation strategies and user engagement.

The skills gap experienced by 58% of students reflects a digital literacy crisis that is structural and systemic. The technical inability to operate the e-journal system expressed by one of the students from FPSI about the ignorance of "how to access it, how to use it" shows that infrastructure investment alone is not enough without being accompanied by a comprehensive and sustainable capacity building program. These findings are reinforced by Cynthia & Sihotang (2023) that digital literacy is an important foundation for developing

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students' critical thinking and problem-solving skills in the digital era. This deficit further exacerbates the digital divide and has the potential to hinder students' academic mobility.

Through the theoretical lens of *the Unified Theory of Acceptance and Use of Technology* (UTAUT), the barriers to e-journal adoption at UNJ can be analyzed in more depth and comprehensively. The *performance expectancy* factor is hampered by students' perceptions of inequality in the quality and quantity of content compared to external sources. *Effort expectancy* is hampered by the complexity of the interface and the high cost of cognitive transactions in the authentication process. *Social influence* is weakened due to the absence *of role modeling* from lecturers and colleagues who are supposed to be agents of change. Meanwhile*, facilitating conditions* are not optimal due to limited supporting infrastructure and integrated *guidance systems*.

The findings on variation in utilization between faculties reveal the complexity of disciplinary gaps in the academic digital ecosystem. The dominance of users from the Faculty of Engineering and FMIPA, along with the marginalization of users from FBS, FIK, and FISH, indicates a disciplinary bias in content development and engagement strategies. The statement of one FBS student that "the appearance does not match the content of the physical journal form in the library, so it is not complete" represents a mismatch between the needs of the specific discipline and the design of the available services. This condition requires a differentiation approach that is more sensitive to the epistemological characteristics of each discipline.

From the perspective of governance and service management, the findings of the study reveal fundamental deficiencies in information dissemination systems and engagement mechanisms. The fact that only 8% of students know about e-journals through official library channels shows the failure of institutional communication strategies in reaching the target audience. This condition requires a paradigmatic reorientation in a more participatory, *user-centric approach* to engagement, and utilizing more effective communication channels. The weak integration between the library information system and the student learning ecosystem also contributes to the low visibility of this service.

In the context of inclusive urban education, the findings of this study highlight the urgency of transforming library service models that are responsive to the heterogeneity of user characteristics. The *uniform* approach that has been applied so far has proven to be ineffective in answering the complexity of different needs between faculties and levels of study. The need to customize services based on user personas is a strategic imperative to ensure *the principle of equity* in digital transformation. This inclusive approach must take into account socio-demographic aspects, digital literacy levels, and specific academic needs.

The policy implications of these findings are multidimensional and require an integrated and sustainable approach. On a technological level, intuitive interface redesign and simplification of the authentication process are needed that take into account the user experience. At the educational level, the integration of digital literacy in the curriculum is a non-negotiable imperative. At the social-institutional level, more synergistic collaboration with lecturers and student organizations is needed to create a conducive ecosystem. Meanwhile, at the collective level, the expansion of access to more relevant and quality resources is absolutely carried out by taking into account the specific needs of each discipline.

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In the future, the transformation of the UNJ library must be based on the philosophy of *equitable access* , *meaningful participation* , and *transformative learning outcomes* . This means not only guaranteeing the availability of digital resources, but also ensuring that every student, regardless of socio-economic background, digital ability, or discipline, has equal agency and opportunity to harness them transformatively. This transformation must include technical, pedagogical, and cultural aspects simultaneously. The success of this transformation will be the main determinant in positioning UNJ as an institution that is able to lead innovation in the Indonesian higher education ecosystem in the era of digital disruption, as well as become a benchmark for the development of inclusive and transformative digital libraries in Indonesia.

Furthermore, the findings of this study open up a space for discussion about the need to recontextualize the theory of digital divide in the scope of Indonesian higher education. The unique socio-cultural characteristics, diversity of student backgrounds, and complexity of the Indonesian education system demand a more contextual theoretical approach. This research also highlights the importance of integrating psychological and sociological perspectives in understanding the phenomenon of technology adoption in the academic environment, given the strong influence of non-technical factors in determining the success of digital transformation.

CLOSING

Based on a comprehensive analysis, this study concludes that the digital gap in the use of electronic learning resources at UNJ is multidimensional, with the main obstacles lying in the aspects of capabilities (skills) and user motivation, no longer just access to materials. However, this study has some limitations. First, the findings from the context of UNJ as an urban university cannot necessarily be generalized to other types of universities in areas with different characteristics. Second, the phenomenological qualitative approach used provides a depth of understanding of students' subjective experiences, but has not quantitatively measured the prevalence of problems. Third, the research only focuses on the perspective of students as end-users, not including holistic views from lecturers, librarians, and policy managers. Fourth, the research focus on e-journals has not reached the dynamics of gaps in the utilization of a wider spectrum of e-learning resources, such as LMS or institutional repositories.

Based on these limitations, further research is recommended to: (1) conduct quantitative or comparative studies to map the distribution and measure the magnitude of the gap at a broader level; (2) carry out multi-perspective and longitudinal research involving all stakeholders to understand the dynamics of the digital ecosystem holistically; (3) exploring gaps in the utilization of other types of electronic learning resources; and (4) develop and test specific intervention models, such as curriculum-integrated digital literacy programs, as well as investigate the real impact of the gap on learning outcomes (*third-level* divide). The practical implication is that the transformation of services at UNJ requires an integrated approach that includes the redesign of *the system with a user-centric paradigm*, the integration of digital literacy into the curriculum, the strengthening of social infrastructure through partnerships with lecturers and students, and the implementation of differentiated collection and training policies according to the characteristics of the discipline.

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