Digital Technology Skills Gap in The Utilization of Artificial Intelligence by Students and Lecturers in Academic

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ABSTRACT

The rise of artificial intelligence in digital media has impacted students' digital skills in the academic world. The lecturers' skills do not match the ease of using AI to provide solutions. So, there is a technological imbalance between students and lecturers. This research aims to determine the use of Artificial Intelligence (AI) among students in supporting academic activities and exploring the digital skills of teaching lecturers facing the phenomenon of using AI in their students' educational activities as a solutive effort to face instant generation. The research method involves observation, in-depth interviews, documentation, and a literature review. This research informant represents active students of all faculties at Bengkulu University who use AI to complete their academic work. Besides that, lecturers and teaching staff for over 40 years have experience dealing with students who use AI. The determination of informants is carried out purposively.

Keywords: Digital Immigrant, Artificial Intelligence, teaching strategy, academic world

INTRODUCTION

The rapid development of digital technology has brought significant changes in various sectors, including education. One of the increasingly essential technologies in the academic environment is artificial intelligence (AI). AI has great potential to improve the learning, research, and education administration process. On the other hand, implementing AI also requires adequate digital skills from its users, both students and lecturers (Eaton et al., 2023).

However, there is a striking gap between the potential use of AI and the digital capabilities possessed by students and lecturers. This gap creates challenges to maximize AI's benefits in the academic environment. Students less familiar with AI technology may have difficulty using it effectively in learning and research (Torre, 2017). Similarly, lecturers who do not have adequate digital skills may be unable to integrate AI into the teaching and mentoring process optimally.

This skills gap can impact the quality of education and innovation opportunities in academic institutions. Therefore, this study aims to identify and analyze the digital technology skills gap among students and lecturers, especially in the use of AI. This research will also explore the factors that affect these gaps and provide strategic recommendations to address these challenges in the context of higher education (Akbarani, 2024).

By understanding and addressing this digital skills gap, it is hoped that academic institutions can be more effective in utilizing AI to improve the quality of education and encourage innovation in the educational field (Eshet-Alkalai, 2012).

Generally, educational institutions experience a gap in the use of technology by lecturers as *digital immigrants* with students who are *digital natives (Madden et al., n.d.:*

Iordache et al., 2017). Likewise, on several occasions at the University of Bengkulu, there were academic discussions with lecturers complaining about the limitations of teaching skills in recognizing or identifying student works that use AI to help students. However, using AI in question can dull students' critical reasoning in analyzing phenomena because they no longer use reason or think critically but prefer to use AI (Nash, 2024).

Research Objectives

1. Identify the gap in digital technology skills among students and lecturers in utilizing artificial intelligence (AI) in the academic environment of the University of Bengkulu.
2. Analyze the factors that affect the digital skills gap, including aspects such as educational background, access to technology, and level of understanding of AI.
   Develop strategic recommendations to reduce the digital skills gap, which includes training programs, curriculum development, and opportunities for other supporting policies at the University of Bengkulu.

LITERATURE REVIEW

Artificial intelligence (AI) development in education has become increasingly discussed in academic literature. Research by Luckin et al. (2016) shows that AI has great potential to revolutionize education through personalized learning, data analysis, and automation of administrative tasks. However, this potential is often not fully realized due to the digital skills gap among users, including students and lecturers.

Digital Skills Gap

The digital skills gap refers to an individual's ability to access, understand, and utilize digital technology. Van Dijk (2005) divides the digital divide into levels, including access to technology, skills in use, and the outcomes or benefits of using that technology. In education, this gap can hinder the effective use of AI. Research by (Qelhas, 2023; Wahyuningsih, 2024) highlights that students and lecturers often lack the technical skills to use AI tools optimally in learning and research.

Use of AI in Education

Several studies have explored how AI can be used in education to improve the quality of teaching and learning. For example, Baker and Smith (2019) explained that AI can support adaptive learning, where AI systems adapt teaching materials and methods according to students' needs and abilities. However, the study also shows that these benefits can only be achieved if users understand how AI works and how to use it in an educational context.

Factors Affecting the Skills Gap

The literature also identifies several factors contributing to the digital skills gap, such as educational background, access to technology, and institutional support. According to research by (Eaton et al., 2023; Kinash et al., n.d.), socially and economically disadvantaged students tend to have lower digital skills compared to their

more fortunate counterparts. This shows the need for a more inclusive approach to digital skills development in the academic environment.

Recommendations for Addressing the Skills Gap

Various recommendations have been put forward in the literature to address the digital skills gap, including intensive training, curriculum updates, and the provision of adequate technological resources. For example (Dhule, Duymaz & Tekin 2023; and Toncic, 2021) recommends that educational institutions develop training programs to strengthen digital skills and understand AI for students and lecturers. Moreover (Librarian, n.d.; Toncic, 2021), educational curricula must be adjusted to integrate AI technology holistically so that all parties can make better use of this technology.

Related Research

Other related research also highlights the importance of institutional support in reducing the digital skills gap. For example, research by (Cathrin & Wikandaru 2023) (Cathrin & Wikandaru, 2023) (*Perils of Artificial Intelligence - Gendron, Andrew and Cooper*, n.d.).

METHODS

This study uses a qualitative approach to explore the digital skills gap in using artificial intelligence (AI) in the academic environment, especially among students and lecturers. The methods include observation, in-depth interviews, and documentation (Creswell, 2015; Kusumastuti Adhi, 2019; Sugiyono, 2013).

1. Observation Method

Observations will be conducted in various higher education institutions to observe firsthand how students and lecturers use AI in their daily academic activities. Observation focuses include:

- The use of AI in learning and teaching: observing how AI is used by lecturers in the teaching process, including in the preparation of lecture materials, evaluations, and interactions with students.
- Use of AI by students: observing how students utilize AI in doing assignments, conducting research, and interacting with lecturers.
- Technology environment: observe the available technological facilities, the accessibility of AI devices, and the technical support the institution provides.

To maintain objectivity, these observations will be carried out non-participantly, where the researcher is not directly involved in the observed activities. Data from these observations will be recorded as field notes and then analyzed to find patterns relevant to the digital skills gap.

2. Interview Method

In-depth interviews will be conducted to explore more information about the experiences and views of students and lecturers related to the use of AI. This interview will be semi- structured, with interview guidelines structured based on the results of initial

observations (Assyakurrohim Dimas et al., 2022; Setiawan, 2012). Interview questions will include:

- Experience using AI: Exploring personal experiences in using AI, including the obstacles and challenges faced.
- Digital Skills: Ask about the level of digital skills you have and how those skills are acquired and developed.
- Views on AI: Understanding the perceptions of students and lecturers towards AI in an academic context and their expectations for this technology.

Interviews will be conducted face-to-face or through an online platform, depending on the situation and conditions of the participants. Each interview will be recorded and then transcribed for further analysis.

3. Documentation Method

Documentation is another method to support the data obtained from observations and interviews. The documentation collected includes:

- Curriculum and Syllabus: Review curriculum documents and syllabi to see how well AI is integrated into educational programs.
- Guidelines for the Use of AI: Review institutional guidelines or policies related to the use of AI, both for lecturers and students.
- Academic Reports and Publications: Collecting reports or publications that discuss the use of AI in the institution that is the object of research.

Documentation data will be analyzed to provide additional context and support findings from observation and interview methods.

Data Analysis

The data obtained from the above three methods will be analyzed thematically. The analysis begins with data coding to identify key themes relevant to the digital skills gap. After that, these themes will be linked to the research objective of understanding the dynamics of the digital skills gap and how it affects the utilization of AI in the academic environment.

This study's observation, interview, and documentation methods are expected to provide a deep understanding of the digital skills gap among students and lecturers in using AI. The results of this study are expected to be the basis for academic institutions to develop more effective strategies for improving digital skills and maximizing the benefits of AI in education. This method is designed to get a comprehensive picture of the existing digital skills gap and the factors that affect it.

RESULTS AND DISCUSSION

Research Results

This research was conducted on students of the University of Bengkulu. The results of the distribution of an open questionnaire to 116 students from all faculties at UNIB found that, generally, students use AI in their academic circles. The student was determined because he often uses AI to complete his academic assignments. Meanwhile, eight lecturers are informants who have experience finding students using AI in completing academic assignments and preparing scientific papers representing all faculties around the University of Bengkulu.

AI is very popular among students

Some of the most popular A.I.s used by college students to help with academic assignments include:

1. ChatGPT and GPT-4: This AI is used for various purposes, such as writing essays, answering complex questions, formulating ideas, and even assisting in programming. ChatGPT's ability to understand and generate text with deep context makes it useful for students.
2. Grammarly: Grammarly is an AI tool that assists students in writing by checking grammar, spelling, and writing style. In addition, Grammarly also provides suggestions for improving the clarity and readability of texts, which is very helpful in academic writing.
3. Turnitin: This AI is popularly used by college students to check for plagiarism. Turnitin compares student writing with an extensive database of existing texts to ensure the originality of their work, which is crucial in academia.
4. Mendeley: Mendeley is an AI-based reference management tool that assists college students in organizing their reference sources, creating citations, and compiling bibliographies automatically, making it more accessible in the academic writing process.
5. Quillbot: Quillbot is an AI tool that assists college students in paraphrasing texts, summarizing documents, and improving writing styles. This is very useful for revising and improving the quality of academic writing.

These tools have become popular among college students due to their ability to improve the efficiency, accuracy, and quality of academic work, thus helping them achieve better academic results.

Student Motivation Using AI

Students increasingly utilize artificial intelligence (AI) in the academic world for various reasons that encourage using this technology as a learning and research tool. One of the main reasons is the ease of access and speed that AI offers in finding and processing information. AI can provide quick solutions by presenting relevant and structured information in an academic environment that often demands extensive data collection and in-depth analysis (Lisenbee, 2016). Students can use AI to search literature, compile bibliographies, or even analyze big data that may be difficult to process manually.

In addition, AI also offers personalization in the learning process. With its ability to tailor teaching materials and methods to suit individual needs and abilities, AI assists students in understanding complex concepts more understandably. AI can provide additional learning resources, such as tutorials or simulations, that are tailored to the student's proficiency level, speeding up the process of their understanding of academic material.

On the other hand, the pressure to achieve optimal academic results also encourages students to use AI. In a competitive educational world, students find it helpful to AI to complete complex tasks, such as essay writing, programming, or research. AI can speed up the writing process by providing suggestions, improving grammar, or generating initial ideas for research topics. This allows students to focus more on critical thinking and in-depth analysis rather than being burdened by time-consuming technical tasks.

The ability of AI to perform fast and accurate data analysis is also a strong reason for students to use it in research. Students involved in research projects are often exposed to enormous volumes of data. AI can assist them in identifying patterns, making predictions, and drawing conclusions from the data, thus enriching the quality of their research. This saves time and improves the accuracy of research results, ultimately contributing to higher academic achievement.

Amid rapid technological developments, students also feel that using AI gives them a competitive advantage in the future. Students realize that the ability to master and utilize AI will be a precious skill in the world of work. Therefore, they are integrating AI into their academic activities to prepare for career challenges in the digital era.

With the various benefits offered, it is not surprising that AI is increasingly becoming a tool students rely on in the academic world. Through AI, students can improve efficiency, deepen understanding, and improve the quality of their scholarly work while preparing for a future increasingly influenced by technology (Duymaz & Tekin, 2023).

Digital Skills Gap in the Utilization of AI in the Academic Environment

The digital skills gap has become essential in the effort to adopt advanced technologies such as artificial intelligence (AI) in the academic environment. In this context, the digital skills gap refers to the difference in abilities between students and lecturers in accessing, understanding, and utilizing AI for academic purposes, including learning, research, and administration. This gap impacts the effectiveness of AI use and the overall quality of education (Lisenbee, 2016).

Factors affecting the digital skills gap between lecturers and students

1. Educational background: One of the main factors affecting the digital skills gap is the individual's academic background. Students and lecturers from more traditional educational backgrounds or less exposed to technology tend to have difficulties utilizing AI. They are less familiar with the basic concepts of AI, how it works, and how this technology can be applied in an academic context.
2. Access to technology: Limited access to technological devices and internet connectivity also contributes to the digital skills gap. Students and faculty with inadequate access to the hardware and software required to use AI may not be able to utilize these technologies effectively. This gap is often more pronounced in less developed regions or among individuals of lower socioeconomic status (Chaudhry & Kazim, 2022).
3. Institutional Support: Support from educational institutions is also an essential factor. Without adequate training, a supportive curriculum, and access to relevant resources, students and faculty may feel overwhelmed or unsure about using AI. Institutions that don't provide enough support will likely experience a more significant digital skills gap.

Research Discussion

This study's results reveal a significant digital skills gap among students and lecturers when utilizing artificial intelligence (AI) in the academic environment. This gap is reflected in the difference in ability between students and lecturers to access, understand, and use AI technology effectively to support their educational activities. These findings align with previous literature highlighting that the digital divide is not only related to access to technology but also includes aspects of skills and optimal use of technology (Dhule, n.d.).

In this study, several key factors influencing the digital skills gap have been identified. First, educational background is one of the critical factors. Students and lecturers less familiar with digital technology tend to have difficulty understanding and implementing AI in their academic assignments. This inability leads to limited use of AI, where technologies that are supposed to increase efficiency and effectiveness are not utilized to their full potential.

In addition, access to technology is also a significant obstacle. It was found that students and lecturers who have limited access to adequate hardware, software, and internet connectivity tend not to be able to make optimal use of AI (Priscilia Murni & Nora Ariesta Dewi, 2024; Salmaso et al., n.d.). This gap is especially felt by those in areas with underdeveloped technological infrastructure or limited financial resources. This emphasizes the importance of educational institutions providing more equitable access to technology so that all parties can use AI better.

Institutional support is also essential in addressing this digital skills gap (Cleopas, 2023). The study found that educational institutions that do not provide adequate training or do not have clear policies regarding the use of AI tend to experience a more significant digital skills gap. Without strong support from institutions, students and lecturers will find it challenging to keep up with such rapid technological developments, including AI's application in the academic environment (Librarian, n.d.).

In this context, developing training programs that improve digital skills, especially in AI, is very important. Well-designed training can help reduce the digital skills gap by providing a deeper understanding of the practical skills necessary to use AI effectively. In addition, updating the educational curriculum that is more integrated with AI technology is also an important recommendation. By incorporating AI into the curriculum, students and lecturers can gradually build their digital skills as technology evolves (Madden et al., n.d.).

CONCLUSION

Conclusion

The digital skills gap in the use of AI in the academic environment is a challenge that must be overcome to ensure that this technology can provide maximum benefits in education. Factors such as educational background, access to technology, and institutional support play an important role in widening or reducing this gap. Therefore, a comprehensive approach, including training program development, curriculum updates, and increased access to technology, is needed to address the digital skills gap and maximize the potential of AI in education. Thus, educational institutions can more effectively prepare students and lecturers to face challenges in the ever-evolving digital era.

Suggestion

Based on the recommendations to address the digital skills gap as follows:

1. Training Program Development: Educational institutions need to develop intensive training programs that focus on improving digital skills, especially in the use of AI. This training should be designed for all levels of users, both students and lecturers, with an adaptive and inclusive approach.
2. Curriculum Update: The educational curriculum needs to be adjusted to integrate AI more thoroughly. Courses related to digital technology and AI should be integral to

the educational program so that students and lecturers can better understand and apply AI in their academic context.

3. Policy Strengthening and Institutional Support: Educational institutions should strengthen policies that support AI adoption, including setting ethical and responsible usage standards. Institutional support must also include providing human resources to assist students and lecturers in facing technological challenges.

By addressing this digital skills gap, academic institutions can ensure that artificial intelligence is utilized optimally to improve the quality of education and drive innovation and efficiency in all aspects of academics. These measures will help create a more inclusive learning environment and prepare students and lecturers to face challenges in the digital era.

REFERENCES

Akbarani, R. (2024). USE OF ARTIFICIAL INTELLIGENCE IN ENGLISH LANGUAGE TEACHING.

International Journal of English Learning and Applied Linguistics (IJELAL), *4*(1), 14–23. https://doi.org/10.21111/ijelal.v4i1.10756

Assyakurrohim Dimas, Dewa Ikhram, Rusdy A Sirodj, & M Win Afgani. (2022). *View of Metode Studi Kasus dalam Penelitian Kualitatif*. Jurnal Pendidikan Sains Dan Komputer. https://jurnal.itscience.org/index.php/jpsk/article/view/1951/2169

Cathrin, S., & Wikandaru, R. (2023). The future of character education in the era of artificial intelligence. *Humanika*, *23*(1), 91–100. https://doi.org/10.21831/hum.v23i1.59741

Chaudhry, M. A., & Kazim, E. (2022). Artificial Intelligence in Education (AIEd): a high-level academic and industry note 2021. *AI and Ethics*, *2*(1), 157–165. https://doi.org/10.1007/s43681-021-00074-z

Cleopas, B. C. (2023). ADVENT OF ARTIFICIAL INTELLIGENCE: PROSPECTS AND CHALLENGES

IN NIGERIA EDUCATION SYSTEM. *Int. J. Educational Research*, *06*(06), 1–09. https://doi.org/10.5281/zenodo.8114160

Creswell, J. W. (2015). *Penelitian Kualitatif & Desain Riset* (3rd ed.). Pustaka Pelajar.

Dhule, S. (n.d.). *International Journal of Advance and Applied Research Application of AI (Artificial Intelligence) in Academic Library Services: An Overview*. www.ijaar.co.in

Duymaz, Y. K., & Tekin, A. M. (2023). Harnessing Artificial Intelligence in Academic Writing: Potential, Ethics, and Responsible Use. *European Journal of Therapeutics*, *30*(1), 87–88. https://doi.org/10.58600/eurjther1755

Eaton, S. E., Brennan, R., Wiens, J., & Mcdermott, B. (2023). *Artificial Intelligence and Academic Integrity: The Ethics of Teaching and Learning with Algorithmic Writing Technologies*.

Eshet-Alkalai, Y. (2012). Thinking in the Digital Era: A Revised Model for Digital Literacy.

Issues in Informing Science and Information Technology, *9*, 267–276. https://doi.org/10.28945/1621

Iordache, C., Mariën, I., & Baelden, D. (2017). Developing digital skills and competencies: A quick-scan analysis of 13 digital literacy models. *Italian Journal of Sociology of Education*, *9*(1), 6–30. https://doi.org/10.14658/PUPJ-IJSE-2017-1-2

Kinash, S. ;, Wood, K. ;, & Knight, D. (n.d.). *Digital immigrant teachers and digital native students: What happens to teaching?* http://epublications.bond.edu.au/tls/50

Kusumastuti Adhi, A. M. K. (2019). *Metode Penelitian Kualitatif*. Lembaga Pendidikan Sukarno Pressindo.

Librarian, C. A. (n.d.). *NewGen Libraries: The World of Artificial Intelligence*.

Lisenbee, P. S. (2016). Generation Gap Between Students' Needs and Teachers' Use of Technology in Classrooms. *Journal of Literacy and Technology*, *17*(3).

Madden, Ad, Nunes, JMB, McPherson, Ford, Miller, & Rico. (n.d.). *A New Generation Gap?*

Some thoughts on the consequences of increasingly early ICT first contact. https://eprints.whiterose.ac.uk/

Nash, B. L. (2024). Critical Inquiry in (and About) Media Environments: Examining an Asset- Based Digital Literacy Curriculum. *Journal of Literacy Research*. https://doi.org/10.1177/1086296X241244700

Perils of Artificial Intelligence - Gendron, Andrew and Cooper. (n.d.).

Priscilia Murni, O., & Nora Ariesta Dewi, E. (2024). *ARTIFICIAL INTELLIGENCE RESEARCH TRENDS IN EDUCATION: BIBLIOMETRIC ANALYSIS USING BIBLIOSHINY*. *9*(1), 1–18. https://doi.org/10.32832/educate.v9i1.15376

Qelhas, M. (2023). DIGITAL INTELLIGENCE IN THE AGE OF ARTIFICIAL INTELLIGENCE.

Proceedings on Engineering Sciences, *5*(4), 759–766. https://doi.org/10.24874/PES05.04.018

Salmaso, S., Singh, K., Sharma, B., Gibelli, F., Campanozzi, L. L., Bailo, P., Nittari, G., Sirignano, A., & Ricci, G. (n.d.). *The role of digital literacy in achieving health equity in the third millennium society: A literature review*.

Setiawan, A. R. (2012). Research design : pendekatan kualitatif, kuantitatif, dan mixed. *Prosiding*, *23*, 1–8. http://library.stik-ptik.ac.id

Sugiyono. (2013). *METODE PENELITIAN KUANTITATIF KUANTITATIF DAN R&D* (Sugiyono, Ed.; 19th ed.). CV. ALFABETA .

Toncic, J. C. (2021). Advancing a critical artificial intelligence theory for schooling. *Teknokultura. Revista de Cultura Digital y Movimientos Sociales*, *19*(1), 13–24. https://doi.org/10.5209/tekn.71136

Torre, G. (2017). Expectations versus reality of artificial intelligence: Using art to examine ontological issues. *Leonardo*, *50*(1), 31–35. https://doi.org/10.1162/LEON_a_01342

Wahyuningsih, S. (2024). Does Artificial Intelligence (AI) Play Roles in Enhancing Academic Writing? Unravelling Lecturers' Voices in Indonesian Higher Education. *Jurnal Pendidikan Progresif*, *14*(1), 489–503. https://doi.org/10.23960/jpp.v14.i1.202436