



Indonesian Students' Perceptions on the Use of Artificial Intelligence (AI) in English Learning

Sri Ningsih^{1*}, Arum Putri Rahayu², Nyayu Yayu Suryani³, Martriwati Martriwati⁴,
Masriatus Sholikhah⁵, Eri Ester Khairas⁶

¹ Department of Midwifery, Midwifery Academy of Tahirah Al Baeti Bulukumba, Bulukumba, Indonesia

² Ma'arif Magetan Islamic College, Magetan, Indonesia

³ Institute of Health Science Siti Khadijah Palembang, Palembang, Indonesia

⁴ Muhammadiyah Prof. DR. HAMKA University, Jakarta, Indonesia

⁵ PGRI Jombang College, Jombang, Indonesia

⁶ State Polytechnic of Jakarta, Jakarta, Indonesia

*Corresponding author. Email: inci_jica@yahoo.co.id

ABSTRACT

In the era of digitalization and rapid technological advancement, AI-driven applications and platforms have become increasingly prevalent in language learning. This study aims to shed light on how Indonesian students perceive the role of AI as a supplementary tool in enhancing their English language proficiency. Data were collected from 252 students in higher education institutions by using student administered questionnaires and analyzed statistically. The questions are adapted from a questionnaire of Robbin & Judge (2013), using three factors that influence students' perceptions: perceiver (P), target (T), and situation (S). The findings suggest that Indonesian students generally hold positive perceptions towards AI tools in English learning. All three variables, P, T, and S, are positively correlated with each other, and these correlations are highly significant at the 0.01 level. The strength of the correlations varies, with the P-T relationship being slightly stronger than the T-S relationship and the P-S relationship being the weakest among the three, but all are still considered strong positive correlations. The outcomes of this study contribute to the broader discourse on technology-enhanced language learning and provide insights into the specific context of Indonesia. These findings can inform educators, policymakers, and technology developers on how to harness AI effectively to support English language acquisition in Indonesian educational settings while addressing students' concerns and ensuring responsible AI usage. Ultimately, this study underscores the importance of understanding students' perceptions and attitudes towards AI as a crucial step in designing effective and culturally sensitive AI-driven language learning solutions.

Keywords: artificial intelligence, English learning, Indonesia, students' perceptions

1. INTRODUCTION

Artificial intelligence (hereinafter referred to as AI) is a technology where machines can learn and understand logic like humans. It is a more modern technological discovery that is beginning to garner attention as a tool for mimicking human behavior [1, 2]. The influence of AI extends beyond lifestyle modifications to reshape how we communicate, work, and engage in academic pursuits, as we navigate the intricacies of our increasingly interconnected world. This technology, unintentionally or not, has become an integral part of our daily lives and

incorporated into many applications such as Google Maps (Google), Siri (Apple), and Cortana (Microsoft).

The integration of AI into education has experienced a notable surge, prompting significant interest and exploration. AI influences education in various ways, impacting how students learn, how teachers work, and ultimately shaping the overall structure of the education system. AI systems, employing educational aides such as bots, facilitate learning by providing personalized experiences. The necessity of applying AI to automatically identify learning styles, thereby enhancing

the effectiveness of personalized e-learning implementations [3].

Leveraging AI in education stands as a cornerstone of contemporary learning in the modern age [4]. As AI has evolved, various platforms have been applied offering numerous benefits in education, such as; 1) Virtual Mentor, 2) Presentation Translator, 3) Global Courses, for example, MOOCs, Udemy, Alison, Khan Academy, edX, Udacity, Coursera, 4) Automatic Assessment, 5) Personalized Learning, such as Ruang Guru, Educational games, 6) Intelligent Tutoring System (ITS) or Intelligent Computer- Aided Instruction (ICAI). Some platforms simplify complex educational materials into more compact and comprehensible formats, including study guides, material summaries, and brief notes. Moreover, they ease the students to deliver bundles of textbooks as content that is more compact materials that are simpler for students to read and comprehend, including study guides, material summaries, or brief notes. Therefore, AI established e-learning as an essential element in higher education curricula on a global scale [5, 6].

AI-powered education solutions are increasingly gaining popularity in the field of language instruction [7, 8]. Some AI-powered language instruction platforms offer personalized learning experiences by tailoring content to individual learners [9]. Through continuous assessment and analysis, these systems adapt to the user's proficiency level, learning pace, and preferences. This personalized approach maximizes the efficiency of language acquisition by addressing each learner's specific needs. AI-driven language instruction also incorporates gamification elements to make the learning process engaging and enjoyable. Gamified approaches leverage competition, rewards, and challenges to motivate learners and maintain their interest. Interactive exercises, quizzes, and language games enhance participation and retention of language skills. These benefits offer personalized, interactive, and immersive experiences that cater to individual needs, making language education more effective, engaging, and accessible for learners worldwide.

However, the adoption of AI in e-learning systems presents challenges in developing countries primarily due to digital disparities [10], including Indonesia. In many regions of Indonesia, there is a lack of widespread access to essential digital devices such as computers, laptops, and tablets. This limited access to technology hampers students' ability to participate in online learning, especially in areas with inadequate technology infrastructure. Economic disparities also contribute to the digital divide, as not all students can afford the necessary devices or internet subscriptions. Families with lower incomes may find it challenging to invest in the technology required for effective e-learning, exacerbating educational inequalities. Teachers face

challenges in adapting to and effectively utilizing e-learning tools. Insufficient training and professional development opportunities for educators can impact their ability to create engaging online content, provide effective virtual instruction, and address the diverse needs of students in a digital learning environment. In addition, the absence of comprehensive government policies and financial support for e-learning initiatives can impede widespread adoption of AI. Adequate policy frameworks and financial support are essential for addressing digital disparities and promoting equitable access to education through technology.

Therefore, understanding students' perceptions of the use of AI in English language learning is crucial for educators, policymakers, and the technology developers. Perception is a neurobiological process occurring within the human brain. The process pertains to the reception of messages or information through the five senses: sight, hearing, smell, taste, and touch [11]. By gaining insights into students' attitudes, beliefs, and experiences, educators can better harness the potential of AI as a language learning tool that aligns with learners' needs and preferences [12, 13, 14]. In order to measure the students' perceptions, this study implements a framework proposed by [15], that emphasizes the interplay of the perceiver's characteristics (P), the attributes of the target (T), and the contextual factors of the situation (S). The perceiver (P) is an individual who examines the target and endeavors to comprehend the visual stimuli, with their interpretation of the object being influenced by their personal attributes, specifically attitudes, motives, interests, experiences, and expectations. A target (T) can be described as the objects of perception or the entities that are being perceived. The target consists of seven sub dimensions that impact an individual's perception: novelty, motion, sound, size, backdrop, closeness, and similarity. Situation (S) or context refers to the time at which we perceive an object or event that can affect our attention, location, and social setting. Throughout the examination of students' perspectives regarding the use of AI on English language learning, this study endeavor seeks to enrich the expanding realm of knowledge concerning the role of AI in language education. Ultimately, this study aims to advance the comprehension of the evolving landscape of English language learning in Indonesia, in the age of Artificial Intelligence technologies. In detail, the study questions guiding in this study are as follows:

1. How do Indonesian students in higher education perceive the incorporation of AI in English language learning, according to Robbin & Judge's (2013) theory?
2. Is there a strong correlation between the perceptions of Indonesian students towards the perceiver (P), target (T), and circumstance (S) variables?

2. METHODS

2.1. Participants

The participants of this study comprise 252 students enrolled in English language programs across six higher education institutions in Indonesia, namely; Politeknik Negeri Jakarta (PNJ), STAI Maarif Magetan, STIK Siti Khadijah Palembang (STIK), Universitas Muhammadiyah Prof. DR. HAMKA (UHAMKA), STKIP PGRI Jombang (STKIP), and Akademi Kebidanan Tahirah Al Baeti Bulukumba (AKTABE). Sample selection employed random sampling methodology, facilitated through the distribution of online questionnaires using Google Forms. Detailed demographic information pertaining to the participating students is elucidated in Figures 1 - 3.



Fig. 1. Sample distribution based on Institution

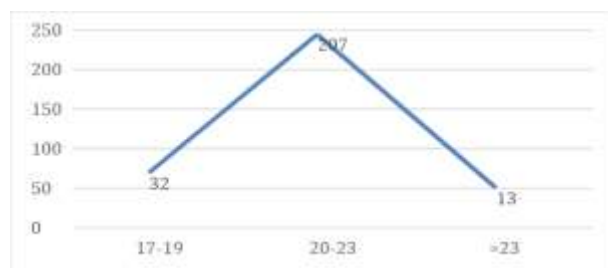


Fig. 2. Sample distribution based on Age

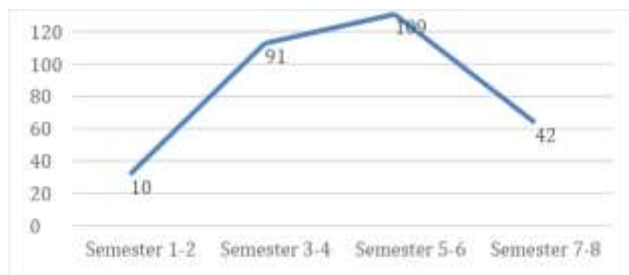


Fig. 3. Sample distribution based on semester intake

Figure 1. illustrates that majority of the participants (63) are from STIK Siti Khadijah Palembang, followed by Jakarta State Polytechnic (55), Akademi Kebidanan Tahirah Al Baeti Bulukumba (48), UHAMKA Jakarta (32), STAI Ma'arif Magetan (25), and STKIP PGRI Jombang (24). According to Figure 2, the majority

participants are 20-23 years old (207), followed by 17-19 years old (32), and >23 years old (13). In addition, Figure 3 shows that the majority of participants are in semester 5-6 (109), followed by semester 3-4 (91), semester 7-8 (42), and semester 1-2 (10).

2.2. Instruments

The data were collected by using questionnaires and analyzed statistically. The questions were adapted from the grand theory of [15], using three factors that influence students' perceptions on new technology: perceiver (P), target (T), and situation (S). The questionnaire consisted of demographic data and students' perception on AI utilization in English learning. In total, 25 items are available distributed to the samples which are divided into three components of perceptions; 10 items measuring the perceiver (P), 8 items for measuring the target (T) and 7 items for the situation (S). A 5-point Likert scale was utilized, wherein each category comprised items ranging from a score of 5 for Strongly Agree (SA) to 4 for Agree (A), 3 for Agree enough (AE), 2 Less Agree (LA), and 1 for Disagree (D). An examination was conducted to assess the validity and reliability of the instrument. The internal consistency of the scale was evaluated using the Cronbach alpha coefficient, which yielded a value of 0.96. The scores demonstrate that the tools are dependable and that researchers may get significant conclusions from the data and analysis.

2.3. Procedures

The study was carried out in multiple phases. The measures were constructed by including the study questions and relevant research. These instruments encompassed students' background information and their perception of the utilization of artificial intelligence (AI) in English learning. Furthermore, the Google form link was sent to the students via a WhatsApp group including English class participants from six higher education institutions. The data was analyzed utilizing the SPSS application, specifically version 25. The alpha-Cronbach coefficient analysis was employed to evaluate the instruments' reliability. Finally, a variety of statistical approaches were employed, such as calculating response percentages from the study sample, computing averages and standard deviations, analyzing individual responses to the questionnaire, and doing. Furthermore, the Spearman's rho analysis was employed to analyze the correlation between the variables.

3. RESULTS

3.1 Variable Analysis

To answer the first question, the researchers measured mean and SD differences between repeated measures

with the same instrument for each dimension and the total degree, as shown in Tables 1–3 below.

Table 1. Means and standard deviation of P Variable

Items	Mean	Standar Deviation
P1. It was easy and I got better at it	3.89	.990
P2. I think AI should be used to help people learn English in college.	3.95	.989
P3. It's hard for me to use AI to help me learn English	2.60	1.276
P4. I use AI on my own will to improve my English skills	3.93	.938
P5. I'm interested in AI only to get better at speaking and writing	3.10	1.459
P6. I'd like to use AI to get better at reading, writing, speaking, and listening.	4.13	.885
P7. AI boosts my English writing confidence	3.63	1.126
P8. I find AI functions easy to use and useful for learning English	3.88	.968
P9. I wish there were more AI tools for learning English	4.02	.923
P10. I learned many entertaining and interesting stuff on AI that improved my interest in learning English.	3.95	.913
Total Average	3.71	

The means (averages) for each item of P variable is vary, ranging from 2.60 to 4.13. These values show the central tendency of the scores for each item. For example, P6 has the highest mean (4.13), indicating that, on average, it received the highest scores among the ten items. The standard deviations for each item vary. Items with lower standard deviations have scores that are closer to their respective means, while items with higher standard deviations have more dispersed scores. For instance, P5 has a relatively high standard deviation (1.459), indicating greater variability in the scores for that item. The standard errors of the mean are small for all items, which suggests that the sample means are likely to be relatively close to the population means.

Table 2. Means and standard deviation of T Variable

Items	Mean	Standar Deviation
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T1. I learned many entertaining and interesting stuff about AI that improved my interest in learning English.	4.04	.898
T2. AI made translation, paraphrasing, grammatical checking, and interactive English-speaking activities easier.	3.77	1.030
T3. Voice and video recording on AI make English conversations easy to interpret.	3.85	.940
T4. I found the AI English-learning app easy to download and fit my phone.	3.68	1.065
T5. The lecturer advised me to utilize AI to study English to reach my learning target.	3.04	1.187
T6. I'll pay the application membership price (if any) for further English-learning benefits.	3.58	1.103
T7. I think AI is similar to social media like Instagram, Facebook and WhatsApp that can be used for learning English.	3.42	1.125
T8. I didn't take long to learn how to use AI in learning English.	3.55	1.098
Total Average	3.63	

Table 2 provides information about a variable labeled "T" across a sample of 252 observations. The means (averages) for each item vary, ranging from 3.04 to 4.04. These values give an idea of the central tendency of the scores for each item. For example, T1 has the highest mean (4.04), indicating that, on average, it received the highest scores among the seven items. The standard deviations for each item also vary. Items with lower standard deviations have scores that are closer to their respective means, while items with higher standard deviations have more dispersed scores. For instance, T5 has a relatively high standard deviation (1.187), indicating greater variability in the scores for that item. The standard errors of the mean are relatively small for all items, which suggests that the sample means are likely to be relatively close to the population means. This indicates a good level of precision in the estimates of the population means.

Table 3. Means and standard deviation of S Variable

Items	Mean	Standar Deviation
S1. I love using AI to study English because my fellow students do too	2.90	1.198
S2. AI prevents me from interacting with university instructors and students, hence I dislike it.	2.33	1.338
S3. I got encouragement and support from parents to learn English with AI	3.11	1.208
S4. My parents seem oblivious of AI-based English learning technology.	3.18	1.229
S5. I feel the university needs to prepare and facilitate AI-based English learning.	3.82	1.062
S6. I feel the government needs to support AI-based learning on campus	3.80	1.091
S7. I think it will inspire my family and friends to use AI to improve English	3.70	1.069
Total Average	3.26	

The mean represents the central tendency of the data for the S variable. The means for the seven items (S1 through S7) are varied, with values ranging from 2.33 to 3.82. These values provide insights into the average scores or measurements for each variable. For example, S5 has the highest mean (3.82), indicating that, on average, it received the highest scores among the eight variables, while S3 has the lowest mean (2.33). In addition, standard deviation measures the dispersion or variability of the data for each variable. The standard deviations for these variables vary, with values ranging from 1.062 to 1.338. A higher standard deviation suggests greater variability. S2 has the highest standard deviation (1.338), indicating that the scores for this variable are more spread out from the mean, while S6 has the lowest standard deviation (0.067), suggesting less variability.

3.2 Correlation Analysis

Table 4. Correlation Analysis

Correlations		P	T	S
Spearman's rho	P	1.000	.774**	.657**
	Correlation Coefficient			
	Sig. (2-tailed)		.000	.000
T	N	252	252	252
	Correlation Coefficient	.774**	1.000	.697**
	Sig. (2-tailed)	.000		.000
S	N	252	252	252
	Correlation Coefficient	.657**	.697**	1.000
	Sig. (2-tailed)	.000	.000	
N		252	252	252

Table 4 presents correlation coefficients, significance levels (two-tailed p-values), and sample sizes for the relationships between three variables: P, T, and S. The correlations are calculated using Spearman's rho, a non-parametric measure of correlation. P, T, and S represent the three variables being examined for their relationships. The main diagonal of the table (from top-left to bottom-right) contains 1.000 in each cell. This is because the correlation of a variable with itself is always 1.000, indicating a perfect positive correlation. The off-diagonal cells (below and above the main diagonal) contain correlation coefficients. These coefficients measure the strength and direction of the relationships between the pairs of variables.

- The correlation coefficient between P and T is 0.774, and the p-value is less than 0.001 (indicated as .000). This correlation is highly statistically significant. The positive correlation coefficient (0.774) suggests a strong positive relationship between P and T, meaning that as one variable increases, the other tends to increase as well.
- The correlation coefficient between T and S is 0.697, and the p-value is less than 0.001 (indicated as .000). This correlation is highly statistically significant.

The positive correlation coefficient (0.697) suggests a strong positive relationship between T and S.

4. DISCUSSION

In general, several crucial aspects are taken into account when perceiving humans or objects. According to [16], perception is influenced by three elements, namely a strong stimulus, physiology and psychology, and environment. Perception is a complex process and differs from each individual. Factors affecting someone's perception come from internal and external individuals. The present study highlighted three significant factors in perceptions (P, T, S) toward AI among participants with different institutions, age, and semester in higher education of Indonesia. Out of twenty-five items spread through online questionnaires, the findings showed that the students perceive AI-driven instruction positively impacts their English learning process. The statistics values of each variable indicate the average response of participants to each statement, mostly high values which suggest positive perception of the situation related to AI-based learning. According to [17], the key to understanding the ultimate adoption of AI teaching assistant-based education is the perceived communication ease and utility of an AI as a learning assistant.

The finding shows that most of the Indonesian students in higher education now demonstrate their awareness of artificial intelligence and its various applications. Based on the results of variable analysis, the participants believe that AI contributes a lot in their learning achievement and elevates learning motivation (*P1 Mean 3.89*). They have a positive attitude towards the AI integration in English learning classrooms (*P6 Mean 4.13*) since the AI driven Apps are handy and meet their needs (*P9 Mean 4.02*). The positive findings are in line with previous studies which revealed that AI cultivates students' preparedness for engaging in English as a Foreign Language (EFL) interactions, while simultaneously improving their pronunciation and vocabulary skills [18]. Moreover, the utilization of dialogue systems in AI applications can help mitigate the levels of speaking anxiety experienced by students [19]. In line, the audiolingual method is utilized by dialogue systems to effectively recognize and adjust to the interactive actions of individual students, hence facilitating their active participation in the usage of the target language [20].

Most participants perceive that AI contributes to language skill elevation and reduces anxiety because the tools are varied and some of them are already familiar with it (*T3 Mean 3.85*). Duolingo and BBC Learning English assist them in skyrocketing their speaking skills and pronunciations. In terms of academic writing and deriving information, most students utilize Chat GPT, Grammarly, and Quill Bot.

In order to polish their work aside from the citation management system, they use Mendeley and Zotero. The findings align with previous studies conducted around the globe in various fields. Moreover, a recent study revealed that AI could aid teachers and pupils; it also suggests considering students' motivation and teachers' technological and pedagogical ability when integrating AI into EFL classrooms [21]. However, there were some participants who did not know much about AI and weren't good at using it. Because of this, face-to-face teaching, training manuals, and detailed instructions are necessary to help the using AI technology, understand how it works, and teach students more about its benefits [22, 23].

The findings also show the three variables of Perceiver (P), Target (T) and Situation (S) are intertwined that indicate the successful instructional process if only they share the equal correlation. A positive relationship exists between P and T, meaning that as one variable increases, the other also tends to grow. Interestingly, the positive correlation also occurs between T and S. This ultimate finding becomes the central issue of the following discussion and implications for using AI in English learning. In detail, the finding vividly indicates the positive correlation between P and T, which reaches 0.774. The value reveals a robust and highly statistically significant relationship between variables P and T. This correlation coefficient measures the strength and direction of the linear relationship, ranging from -1 to 1. In this case, the positive value of 0.774 signifies a strong positive correlation. This adds valuable insights into the nature of the relationship between P and T, suggesting that changes in one variable are associated with systematic changes in the other. Furthermore, the correlation analysis between variables T and S yields a noteworthy result, demonstrating a highly statistically significant relationship. The correlation coefficient, denoted as 0.697, indicates a positive association between the two variables. This correlation coefficient, which ranges from -1 to 1, signifies the strength and direction of the linear relationship. In this case, the positive value of 0.697 suggests a strong positive correlation. This finding aligns with the study from [24], which uncovered a notable disparity in the attitudes of male and female senior secondary students towards Artificial Intelligence.

Despite all the contributions, some initially consider that AI-powered applications harm the teacher's existence. As AI becomes increasingly capable of delivering personalized instruction, teachers' traditional roles may transform. However, recent study reveals that they are neither detrimental nor a threat to the teacher's presence in the learning context [25]. Instead of being primarily instructors, teachers might transition into more supervisory roles. In this new

capacity, they would design and curate machine-led instructional materials, track and assess student progress, and offer assistance and support as needed [26]. Educators, politicians, and curriculum developers need technology preparedness, teacher training, and support to apply AI solutions [13]. English language training can be individualized and adaptive by integrating AI while retaining the human aspect [27]. As revealed in the data of S variable, participants showed that they still need teachers' presence to keep them collaborate and interact among peers. The English class's success will also depend on how the teachers create the AI technology in learning activities. Thus, many students expressed the need for further education and training in the AI field as well as their teacher [28]. AI literacy will enhance students and teachers' comprehension of AI, making it more accurate and beneficial. Balancing the advantages of AI with the necessity to nurture critical thinking, creativity, and originality is crucial [29]. Therefore, it is essential to utilize AI tools within a controlled setting and with appropriate supervision [30].

In the pandemic era, students have been perceiving online classes highly as a means to preserve their academic progress [31]. Thus, AI-powered applications in language learning have been implemented as a valuable instructional resource which enhances the efficiency of English as a Second Language (ESL) acquisition for learners [8]. Using AI technology by EFL students may be advantageous. However, parents and government support are crucial additional factors to consider (S6 Mean 3.80). Parental assistance in providing resources such as cellphones, laptops, and internet connectivity at home would also facilitate students' autonomous acquisition of English using AI. Furthermore, it is imperative for the government to offer funding to the campus in order to provide all the necessary resources and utilities that will enhance AI-driven English education in Indonesia.

5. CONCLUSION

In conclusion, Indonesian higher education students are now generally aware of artificial intelligence and its various applications. They also had positive views regarding the concepts, advantages, and integration of AI in education. This study delved into the Indonesian students' perception of AI integration in English language learning and explored the correlation among three key variables: perceiver (P), target (T), and situation (S). The findings shed light on the positive impact of AI-driven instruction on students' learning processes. Notably, a positive relationship was observed between P and T, as well as between T and S, indicating a favorable disposition towards AI integration in the English learning environment.

However, this study underscores the importance of providing adequate education and training to both students and educators to effectively harness the potential of AI while preserving the human element in education and other fields. Importantly, AI was not seen as a threat to the teacher's role in English learning context. Educators were encouraged to embrace technology preparedness and training to make the most of AI solutions while preserving the human aspect of education. Thus, the success of AI integration relied heavily on teachers' technological aptitude and their ability to incorporate AI technology into English learning activities. In addition, the students also expressed the need for parents and government support in facilitating their English learning with the integration of AI.

The findings presented in this work offer valuable insights for future research. It is suggested more up-to-date systematic evaluations that examine student perceptions on online education and their preferences for instructional formats. Additionally, doing additional research with a broader range of universities and samples from various specializations will serve to validate or challenge the conclusions of the present study.

REFERENCES

- [1] Rich, E., Knight, K., & Nair, S. B. *Predicting Students' Learning Outcomes Using Eye-Tracking Data* (p. 568). (1991)
- [2] Dong, Y., Hou, J., Zhang, N., & Zhang, M.. Study on How Human Intelligence, Consciousness, and Cognitive Computing Affect the Development of Artificial Intelligence Complexity. (2020) <https://doi.org/10.1155/2020/1680845>
- [3] Supangat, S., Saringat, M. Z. B., & Koesdijarto, R. Pemanfaatan Artificial Intelligence (AI) sebagai Respon Learning Style Mahasiswa. Proceeding KONIK (Konferensi Nasional Ilmu Komputer), 5, 270-279. (2021).
- [4] Cardona, et al. Artificial Intelligence and the Future of Teaching and Learning. May 1–64. (2023).
- [5] Haleem, A., Javaid, M., Qadri, M. A., & Suman, R. Understanding the role of digital technologies in education: A review. *Sustainable Operations and Computers*, 3(February), 275–285. (2022). <https://doi.org/10.1016/j.susoc.2022.05.004>.
- [6] Okoye, K., Hussein, H., Arrona-Palacios, A., Quintero, H. N., Ortega, L. O. P., Sanchez, A. L., Ortiz, E. A., Escamilla, J., & Hosseini, S. Impact of digital technologies upon teaching and learning in higher education in Latin America: An outlook on the reach, barriers, and bottlenecks. In *Education and Information Technologies* (Vol. 28, Issue 2). Springer US. (2023). <https://doi.org/10.1007/s10639-022-11214-1>

- [7] Moore, J. L., Dickson-Deane, C., & Galyen, K. E. E-Learning, online learning, and distance learning environments: Are they the same? *Internet and Higher Education*, 14(2), 129–135. (2011). <https://doi.org/10.1016/j.iheduc.2010.10.001>
- [8] Moulieswaran & Kumar, Prasantha. Investigating ESL Learners' Perception and Problem towards Artificial Intelligence (AI) -Assisted English Language Learning and Teaching. *World Journal of English Language*. Vol. 13, No. 5. (2023). <http://wjel.sciedupress.com>
- [9] Soori, M., Arezoo, B., & Dastres, R. Artificial intelligence, machine learning and deep learning in advanced robotics, a review. *Cognitive Robotics*, 3(March), 54–70. (2023). <https://doi.org/10.1016/j.cogr.2023.04.001>
- [10] Eltahir, M. E. E-Learning in Developing Countries: Is it a Panacea? A Case Study of Sudan. *IEEE Access*, 7, 97784–97792. (2019). <https://doi.org/10.1109/ACCESS.2019.2930411>
- [11] Slameto. Belajar dan faktor-faktor yang mempengaruhinya. Rineka Cipta. (2003).
- [12] Aljohani, R. A. Teachers and students' perceptions on the impact of artificial intelligence on English Language Learning in Saudi Arabia. *Journal of Applied Linguistics and Language Study*, 8(1), 36–47. (2021).
- [13] Hartono, W. J., Kase, E. B. S., & Lake, F. Artificial Intelligence (AI) Solutions In English Language Teaching: Teachers-Students Perceptions And Experiences. *Artificial Intelligence*, 06(01). (2023).
- [14] Chan, C. K. Y., & Hu, W. Students' voices on generative AI: perceptions, benefits, and challenges in higher education. *International Journal of Educational Technology in Higher Education*, 20(1). (2023). <https://doi.org/10.1186/s41239-023-00411-8>
- [15] Robbins, S., & Judge, T. *Organizational Behaviour* (S. Yagan (ed.); Fifteenth). Pearson. (2013).
- [16] Walgito, B. *Pengantar Psikologi umum*. Andi. (2004).
- [17] Santiago Jr, et al. (2021). Flexible Learning Adaptabilities in the New Normal: E-Learning Resources, Digital Meeting Platforms, Online Learning Systems and Learning Engagement. *Asian Journal of Distance Education*, 16(2), 43.
- [18] Sumakul, D. T. Y. G., Hamied, F. A., & Sukiyadi, D. Artificial Intelligence in EFL Classrooms: Friend or Foe? *LEARN Journal: Language Education and Acquisition Study Network*, 15(1), 232–256. (2022).
- [19] Bashori, M., Van Hout, R., Strik, H., Cucchiarini, C. Web-based language learning and speaking anxiety. *Computer Assisted Language Learning* Volume 35. Issue 5-6. (2022). <https://doi.org/10.1080/09588221.2020.1770293>
- [20] Aini, Q., Budiarto, M., Putra, P. O. H., & Rahardja, U. Exploring E-learning Challenges During the Global COVID-19 Pandemic: A Review. *Jurnal Sistem Informasi*, 16(2), 57–65. (2020). <https://doi.org/10.21609/jsi.v16i2.1011>
- [21] Ja'ashan, et al. (2020). The Challenges and Prospects of Using E-learning among EFL Students in Bisha University. *Arab World English Journal*, 11(1), 124–137. <https://doi.org/10.24093/awej/vol11no1.11>
- [22] Mousavi Baigi, S. F., Sarbaz, M., Ghaddaripouri, K., Ghaddaripouri, M., Mousavi, A. S., & Kimiafar, K. Attitudes, knowledge, and skills towards artificial intelligence among healthcare students: A systematic review. *Health Science Reports*, 6(3), e1138. (2023). <https://doi.org/10.1002/hsr2.1138>
- [23] Fitria, Tira Nur. "Artificial Intelligence (Ai) In Education: Using Ai Tools for Teaching and Learning Process." *Prosiding Seminar Nasional & Call for Paper STIE AAS*. (2021)
- [24] Ali, S., Abuhmed, T., El-Sappagh, S., Muhammad, K., Alonso-Moral, J. M., Confalonieri, R., Guidotti, R., Del Ser, J., Díaz-Rodríguez, N., & Herrera, F. Explainable Artificial Intelligence (XAI): What we know and what is left to attain Trustworthy Artificial Intelligence. *Information Fusion*, 99(March), 101805. (2023). <https://doi.org/10.1016/j.inffus.2023.101805>
- [25] Zou, B., Liviero, S., Hao, M., & Wei, C. (2020). Artificial Intelligence Technology for EAP Speaking Skills: Student Perceptions of Opportunities and Challenges. In M. R. Freiermuth & N. Zarrinabadi (Eds.), *Technology and the Psychology of Second Language Learners and Users* (pp. 433–463). Springer International Publishing. https://doi.org/10.1007/978-3-030-34212-8_17
- [26] Almusaed, A., Almssad, A., Yitmen, I., & Homod, R. Z. Enhancing Student Engagement: Harnessing "AIED"'s Power in Hybrid Education—A Review Analysis. *Education Sciences*, 13(7), 632. (2023). <https://doi.org/10.3390/educsci13070632>

- [27] Hartono, W. J., Nurfitri, Ridwan, Kase, E. B. S., Lake, F., & Zebua, R. S. Y. Artificial Intelligence (AI) solutions in English Language Teaching: Teachers-students' perceptions and experiences. *Journal on Education*, 6(1), 1452–1461. (2023).
- [28] Fabriz, S., Mendzheritskaya, J., & Stehle, S. (2021). Impact of Synchronous and Asynchronous Settings of Online Teaching and Learning in Higher Education on Students' Learning Experience During COVID-19. *Frontiers in Psychology*, 12(October).
<https://doi.org/10.3389/fpsyg.2021.733554>
- [29] Crittenden, W. F., Biel, I. K., & Lovely, W. A. (2019). Embracing Digitalization: Student Learning and New Technologies. *Journal of Marketing Education*, 41(1), 5–14.
<https://doi.org/10.1177/0273475318820895>
- [30] Barrot, J. S., Llenares, I. I., & del Rosario, L. Students' online learning challenges during the pandemic and how they cope with them: The case of the Philippines. *Education and Information Technologies*, 26(6), 7321–7338. (2021).
<https://doi.org/10.1007/s10639-021-10589-x>.
- [31] Oke, A., & Fernandes, F. A. P. Innovations in teaching and learning: Exploring the perceptions of the education sector on the 4th industrial revolution (4IR). *Journal of Open Innovation: Technology, Market, and Complexity*, 6(2), 31. (2020).
<https://doi.org/10.3390/JOITMC6020031>

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