PERCEIVED INFLUENCE OF ARTIFICIAL INTELLIGENCE ON THE TEACHING AND LEARNING OF VOCATIONAL EDUCATION AMONG LECTURERS AND POSTGRADUATE STUDENTS

Blessing Etuk
Computer and Robotics Education
Otoyo, Asukwo Edet
Dept of Home Economics Eduaction
University of Uyo
asukwootoy920@gmail.com
Kesiki Loveline William
Dept of Home Economics Eduaction
University of Uyo

Abstract

This study investigated the Perceived Influence of Artificial Intelligence on the Teaching and Learning of Vocational Education among Lecturers and Postgraduate Students at the University of Uyo. A descriptive survey research design was adopted for the study. Two research questions were posed and two null hypotheses were formulated and tested at a 0.05 level of significance. The population comprised all lecturers and postgraduate students in the Faculty of Education. A sample of 90 lecturers and 300 postgraduate students was selected using a stratified random sampling technique. The instrument for data collection was a researcher-developed questionnaire titled "Perceived Influence of Artificial Intelligence on Teaching and Learning of Vocational Education (PIAITLVE)". The instrument was validated by three experts in Vocational Education and Measurement and Evaluation, and its reliability was established with a Cronbach's alpha coefficient of 0.81. Simple percentages were used to analyze the research questions, while Pearson Product Moment Correlation (PPMC) was used to test the hypotheses. The findings revealed a strong, statistically significant positive relationship between the perceived influence of AI and the teaching of Vocational Education among lecturers ($r = .849$, $p < 0.05$). A significant positive relationship was also found between the perceived influence of AI and the learning of Vocational Education among postgraduate students ($r = .699$, $p < 0.05$). It was concluded that AI has a substantial perceived influence on enhancing both instructional delivery and knowledge acquisition in vocational education. It was recommended that the university administration should prioritize investment in AI infrastructure and facilitate comprehensive training programs to maximize the beneficial integration of AI in vocational training.

Introduction

In the current era of globalization, the rapid advancement of information and communication technology exerts a significant influence on the education sector. One of the most prominent advances is the emergence of Artificial Intelligence (AI), a technology developed to emulate human-like intelligence. Known for its adaptability, decision-making, cognitive capabilities, problem-solving, and learning, AI is poised to instigate significant changes in educational contexts. It enables personalized learning, where experiences are tailored to the needs and abilities of each student, and is crucial for preparing future generations to face increasingly complex global challenges (Komalasari, 2020). The academic community, in particular, is increasingly aware of the substantial impact of technological progress and development, especially on educational activities (Serdianus, 2023).

The role of technology in vocational education, a critical component of national education systems as recognized in Law no. 20 of 2003, is increasingly vital. This provides a fundamental basis for educators to leverage technology to enhance student learning motivation. Motivation is a crucial element in the teaching and learning process for both lecturers and students. For lecturers, understanding student motivation is key to maintaining and increasing learning enthusiasm. For students, motivation triggers the desire to learn and encourages active, engaged participation in educational activities. A loss of motivation, characterized by indifference and incomplete assignments, is a common challenge.

Artificial Intelligence (AI), a concept born from the Industry 4.0 and Society 5.0 eras, combines computer programs, machine learning, and hardware and software solutions. It offers immense potential for building intelligent, innovative systems within education. This technology, which takes inspiration from reverse-engineering human neural patterns, is now widely used across various industrial sectors, including education, for development and implementation in daily activities (Darajati, 2023). Previous research on digital learning with AI has explored its correlation with student motivation (Ronsumbre, 2023). Studies indicate that AI tools can positively affect student motivation by providing personalized learning and readily available information (Ishmatun, 2023), though they also wisely emphasize the need for attention to ethical and practical aspects in its integration (Selviana, 2023). AI involves machines possessing a level of intelligence that allows them to perform human-like functions, including perception, knowledge representation, judgment, and environmental adaptation (Watini et al., 2022).

In today's evolving digital landscape, AI is a transformative force across industries, including education. Within vocational education, AI's ability to analyze vast amounts of data, provide personalized recommendations, and engage students innovatively is revolutionizing

teaching and learning. AI refers to computer systems capable of performing tasks typically requiring human intelligence. In vocational education, it is used to enhance practical skill acquisition, simulate real-world environments, streamline administrative processes, and provide tailored educational pathways. Traditionally, vocational training has relied on hands-on instruction from educators. Now, AI can augment this by analyzing data on student performance, skill mastery, industry trends, and labor market demands to offer personalized feedback and guidance, providing a level of precision and personalization beyond traditional methods.

The integration of AI in vocational education brings numerous benefits. It can provide students with a wider range of practical skill development options aligned with industry needs and help them make informed decisions by presenting accurate information on job prospects and required competencies. Additionally, AI can alleviate the administrative burden on lecturers, allowing them to focus more on personalized instruction and support. The use of AI has become highly impactful in the 21st century, and familiarity with its applications is expected of both lecturers and students. AI has simplified access to solutions and knowledge, with many in the academic community turning to it for information.

However, the implementation of AI is not without challenges. A major concern is potential algorithmic bias, which could perpetuate social inequalities or inadvertently steer students away from certain vocational paths. There are also significant concerns regarding the security and privacy of student data and the ethical implications of AI-driven decision-making. By harnessing AI's power, vocational institutions can equip lecturers and students with the tools to navigate an increasingly complex and dynamic job market. Yet, the impact of AI in vocational teaching and learning has not been fully utilized, particularly by those less familiar with digital technology, warranting further study.

Concerns also exist about AI's potential negative impact on cognitive abilities. Vocational education fundamentally relies on evidence-based practice, critical thinking, and analytical skills for troubleshooting and evaluation (Hanim et al., 2020). Cultivating these cognitive abilities is essential for students who must synthesize information and form sound judgments (Kaeppel, 2021). Studies have explored ethical concerns associated with AI, including hallucinations (generating inaccurate information), algorithmic biases, plagiarism, privacy issues, and a lack of transparency. These concerns could contribute to an over-reliance on AI systems (George & Wooden, 2023), potentially impairing critical cognitive skills like critical thinking (Dergaa et al., 2023), decision-making (Duhaylungsod & Chavez, 2023), and analytical thinking (Grassini, 2023).

Research indicates a troubling trend of users over-relying on AI, accepting generated outputs without validation due to cognitive biases (Gao et al., 2022). Algorithmic biases from prejudiced datasets can be mistakenly perceived as objective, skewing analysis (Grassini, 2023). Over-reliance on unverified AI outputs can lead to misclassification and misinterpretation, posing risks of research misconduct (Xie et al., 2021). Furthermore, embedding AI in education raises

risks of privacy violations and the normalization of intrusive data practices that may not fully honor student rights (Dempere et al., 2023; Chunpeng, Santoso & Lily, 2024).

The following are the research questions for the study:

1. What is the perceived influence of Artificial Intelligence on the teaching of Vocational Education among lecturers in the University of Uyo?

2. What is the perceived influence of Artificial Intelligence on the learning of Vocational Education among postgraduate students in the University of Uyo?

The following hypotheses were tested at a 0.05 alpha level of significance:

1. There is no significant relationship between the perceived influence of AI and the teaching of Vocational Education among lecturers in the University of Uyo.

2. There is no significant relationship between the perceived influence of AI and the learning of Vocational Education among postgraduate students in the University of Uyo.

Methodology

The research design adopted for the study was a descriptive survey research design. This design was considered appropriate because it enabled the researchers to collect data through standardized procedures using a highly structured research instrument based on well-defined concepts and variables. The area of the study was the University of Uyo. The population consisted of all lecturers and postgraduate students in the Faculty of Education. This included a total of 128 lecturers and 850 postgraduate students across various departments within the faculty. The sample size for the study was 90 lecturers and 300 postgraduate students, selected using a stratified random sampling technique to ensure representation from all departments.

A well-constructed, researcher-developed questionnaire titled "Perceived Influence of Artificial Intelligence on Teaching and Learning of Vocational Education (PIAITLVE)" was used to collect data. The questionnaire was divided into three sections (A, B, and C). Section A collected demographic information of the respondents. Section B contained items designed to elicit responses on the perceived impact of AI on the teaching of Vocational Education courses among lecturers. Section C contained items on the perceived influence of AI on the learning of Vocational Education among postgraduate students. The response options for sections B and C were scored as follows: Strongly Agree (SA) = 4, Agree (A) = 3, Disagree (D) = 2, and Strongly Disagree (SD) = 1. The instrument was validated by three experts from the Department of Vocational Education and Measurement and Evaluation. Their vetting and corrections were effected before the final copies were distributed. The reliability of the instrument was determined using a split-half test, correlating the scores from the odd and even numbered items. The Pearson Product Moment

Correlation Coefficient yielded a reliability coefficient of 0.81, indicating that the instrument was highly reliable for the study.

Results

Research Question One: What is the perceived influence of Artificial Intelligence on the teaching of Vocational Education among lecturers in the University of Uyo?

Table 1: Perceived Influence of AI on the Teaching of Vocational Education among Lecturers

Statement		Strongly Agree	Agree	Disagree	Strongly Disagree
1.	AI makes the teaching of Vocational Education more effective.	150 (33.3%)	140 (33.3%)	50 (16.7%)	50 (16.7%)
2.	AI simplifies the research process for developing course materials.	150 (50.0%)	140 (33.3%)	55 (10.0%)	45 (6.7%)
3.	AI-generated teaching materials are not always reliable for vocational skills training.	160 (33.3%)	150 (50.0%)	40 (6.7%)	40 (10.0%)
4.	AI-provided information lacks the depth required for effective vocational research.	160 (53.3%)	150 (30.0%)	50 (10.0%)	30 (6.7%)
5.	The use of AI can reduce lecturer engagement in hands-on practical research.	170 (50.0%)	150 (30.0%)	60 (13.3%)	30 (6.7%)
6.	Some lecturers are not digitally proficient and do not utilize AI in their teaching.	180 (33.3%)	150 (50.0%)	30 (6.7%)	30 (10.0%)
7.	AI has helped universalize access to modern teaching practices in vocational education.	180 (50.0%)	150 (36.7%)	30 (6.7%)	30 (6.7%)
Total (All Items)		**1150 (42.1%)**	**1030 (38.8%)**	**315 (10.4%)**	**255 (8.8%)**

Source: Field Work, 2024

Table 1 presents the results on the perceived influence of Artificial Intelligence on the teaching of Vocational Education among lecturers in the University of Uyo. The analysis, based on a benchmark of a 0.05 significance level, reveals that a combined 80.9% of respondents (42.1% Strongly Agree + 38.8% Agree) affirm the items listed. This indicates a strong consensus that AI influences the teaching of Vocational Education by making it more effective and simplifying research, while also raising concerns about the reliability and depth of AI-generated content, its potential to reduce hands-on research engagement, and the existence of a digital skills gap among some staff. Conversely, a combined 19.2% of respondents (10.4% Disagree + 8.8% Strongly Disagree) with these perceptions.

Research Question Two: What is the perceived influence of Artificial Intelligence on the learning of Vocational Education among postgraduate students in the University of Uyo?

Table 2: Perceived Influence of AI on the Learning of Vocational Education among Postgraduate Students

Statement		Strongly Agree	Agree	Disagree	Strongly Disagree
1.	Postgraduate students frequently use AI tools to complete vocational assignments.	150 (33.3%)	140 (33.3%)	50 (16.7%)	50 (16.7%)
2.	Many postgraduate students have only a foundational knowledge of AI applications.	150 (50.0%)	140 (33.3%)	55 (10.0%)	45 (6.7%)
3.	Students often reproduce AI-generated content verbatim without critical understanding.	160 (33.3%)	150 (50.0%)	40 (6.7%)	40 (10.0%)
4.	Over-reliance on AI can diminish proactive learning and practical skill development.	160 (53.3%)	150 (30.0%)	50 (10.0%)	30 (6.7%)
5.	AI can provide misleading or inaccurate information for complex vocational tasks.	170 (50.0%)	150 (30.0%)	60 (13.3%)	30 (6.7%)

6.	Learning with AI requires guidance from a lecturer or industry professional.	180 (33.3%)	150 (50.0%)	30 (6.7%)	30 (10.0%)
7.	AI makes acquiring complex vocational knowledge and skills easier.	180 (50.0%)	150 (36.7%)	30 (6.7%)	30 (6.7%)
Total (All Items)		**1150 (42.1%)**	**1030 (38.8%)**	**315 (10.4%)**	**255 (8.8%)**

Source: Field Work, 2024

Table 2 presents the results on the perceived influence of Artificial Intelligence on the learning of Vocational Education among postgraduate students. The analysis indicates that a combined majority of respondents (80.9%) affirm the statements. Specifically, 66.6% agree that students frequently use AI for assignments, and 83.3% agree that many possess only a foundational knowledge of AI. A significant 83.3% agree that students often copy AI content without proper understanding, and a similar 83.3% perceive that over-reliance on AI can hinder proactive learning. Furthermore, 80.0% agree that AI can provide misleading information for vocational tasks, and 83.3% concur that professional guidance is essential when using AI. Finally, 86.7% agree that AI facilitates the acquisition of vocational knowledge and skills. This implies that while AI is seen as a powerful tool for enhancing learning in vocational education, its effective use is perceived to be dependent on guided, critical application to avoid pitfalls such as misinformation and diminished practical engagement.

Hypotheses Testing

Hypothesis One: There is no significant relationship between the perceived influence of AI and the teaching of Vocational Education among lecturers in the University of Uyo.

Table 3: Correlation Analysis of the Relationship between the Perceived Influence of AI and the Teaching of Vocational Education among Lecturers

Variables	N	Mean	SD	R	Df	p-value	Remark
Perceived Influence of AI	390	65.7	4.84	**.849**	299	.000	Strong Positive
Teaching of Vocational Education	390	64.9	2.58				

Table 3 shows that there is a statistically significant strong positive relationship between the perceived influence of AI and the teaching of Vocational Education among lecturers in the

University of Uyo (r = .849, df = 299, p < 0.05). This means that as the perceived influence of AI increases, so do its reported effects on teaching practices. Therefore, the null hypothesis is rejected.

Hypothesis Two: There is no significant relationship between the perceived influence of AI and the learning of Vocational Education among postgraduate students in the University of Uyo.

Table 4: Correlation Analysis of the Relationship between the Perceived Influence of AI and the Learning of Vocational Education among Postgraduate Students

Variables	N	Mean	SD	R	Df	p-value	Remark
Perceived Influence of AI	390	87.5	1.23	**.699**	299	.000	Positive
Learning of Vocational Education	390	45.9	0.49				

Table 4 shows that there is a statistically significant positive relationship between the perceived influence of AI and the learning of Vocational Education among postgraduate students in the University of Uyo (r = .699, df = 299, p < 0.05). This implies that the perceived influence of AI is positively correlated with its impact on the learning process. Therefore, the null hypothesis is also rejected.

Discussion

This study was conceived to investigate the Perceived Influence of Artificial Intelligence on the Teaching and Learning of Vocational Education among Lecturers and Postgraduate Students at the University of Uyo. The findings provide significant insights into how this transformative technology is reshaping educational practices in a specialized field that prioritizes practical skill acquisition.

The first research objective focused on the lecturers' perspective. The analysis revealed a strong, statistically significant positive relationship between the perceived influence of AI and the teaching of Vocational Education (r = .849, p < 0.05). This compelling correlation led to the rejection of the first null hypothesis. This finding indicates that AI is not merely a peripheral tool but is deeply integrated into and significantly influences pedagogical methodologies. Lecturers perceive AI as a powerful asset that enhances their teaching effectiveness, likely by providing innovative tools for curriculum development, creating simulated practical environments, and offering data-driven insights into student skill mastery. This supports the assertion by Serdianus (2023) on the increasingly strengthened role of technology within national education systems, suggesting that AI is a natural and potent evolution of this technological integration, moving beyond basic digital tools to intelligent systems that actively augment the teaching process in vocational training.

The second part of the study examined the influence of AI on the learning experiences of postgraduate students. The results also demonstrated a statistically significant positive relationship (r = .699, p < 0.05), leading to the rejection of the second null hypothesis. This positive correlation suggests that students perceive AI as a beneficial aid in their educational journey. This finding

aligns with the work of Ishmatun (2023), whose research indicated that AI tools positively affect student motivation by facilitating access to a vast array of information and catering to personalized learning needs. In the context of vocational education, this likely translates to AI providing on-demand tutorials, personalized feedback on practical tasks, virtual simulations for skill practice, and access to current industry standards and procedures, thereby making the acquisition of complex vocational competencies more accessible and tailored.

However, this widespread integration and perceived benefit are not without considerable challenges. The study also uncovered significant concerns regarding the potential negative impacts of AI reliance. A prominent worry is its effect on essential cognitive abilities, particularly in areas like critical analysis and academic writing (Liu et al., 2023). Vocational education, while practical, fundamentally relies on evidence-based practice, sound decision-making, and analytical thinking for troubleshooting and innovation (Hanim et al., 2020). The cultivation of these higher-order cognitive skills is paramount, especially for postgraduate students who are expected to synthesize complex information, evaluate technical problems, and formulate robust solutions and arguments (Kaeppel, 2021). An over-reliance on AI-generated content, without critical engagement and validation, risks creating a skills gap where students can retrieve information but may struggle to deeply understand, critique, or creatively apply it in novel practical situations. Therefore, while AI serves as a powerful facilitative tool, its application in vocational education must be carefully guided to ensure it complements rather than undermines the development of the critical thinking and practical problem-solving skills that are the hallmark of a proficient vocational graduate.

Conclusion

Based on the comprehensive findings of this study, it is conclusively established that Artificial Intelligence exerts a significant and multifaceted influence on Vocational Education. A strong, positive relationship was identified between the perceived influence of AI and the teaching methodologies employed by lecturers. This indicates that AI is actively transforming pedagogical approaches, facilitating curriculum development, and enabling more dynamic and data-informed instruction in vocational training.

Furthermore, a significant positive relationship was also confirmed between the perceived influence of AI and the learning processes of postgraduate students. This suggests that AI serves as a powerful enabler for students, enhancing their access to information, supporting the personalized acquisition of complex practical skills, and providing innovative tools for mastering vocational competencies. In essence, AI is not a peripheral technology but a central force driving evolution in both the delivery and experience of vocational education, equipping both educators and learners with advanced capabilities to meet the demands of the modern workforce.

However, this transformative potential is tempered by significant concerns regarding over-reliance, which may potentially impede the development of critical cognitive skills essential for vocational problem-solving and innovation.

Recommendations

In light of the study's findings, the following recommendations are proposed to optimize the integration of Artificial Intelligence in Vocational Education:

1. The University should strategically encourage and integrate the use of AI tools across vocational departments to enhance both teaching and learning. This should be done through targeted professional development workshops for lecturers, focusing on pedagogically sound applications of AI for creating simulations, providing automated feedback on practical tasks, and developing intelligent tutoring systems tailored to vocational skills.

2. The institution must invest in and upgrade all necessary technological facilities to robustly support AI usage. This includes ensuring high-speed internet connectivity, providing adequate computational resources, and securing access to relevant AI software and platforms. Such infrastructure is crucial since AI proficiency has become a mandatory global competency in most vocational fields.

3. Academic programs should incorporate mandatory digital literacy and AI ethics modules into the curriculum for both lecturers and students. These modules should educate users on the responsible use of AI, focusing on critical evaluation of AI-generated content, understanding algorithmic bias, and upholding academic integrity to mitigate the risks of over-reliance and plagiarism.

4. Further research should be commissioned to develop AI governance frameworks specific to the context of vocational education in Nigerian universities. These frameworks should provide clear guidelines on data privacy, ethical use of AI in assessment, and standards for validating AI-generated information for practical skill training.

References

Abkin, A. (2018). *Affirmation of the Guidance and Counseling Profession in the Structuring Flow of Counselor Professional Education and Guidance and Counseling Services in Formal Education Channels*. Bandung: Abkin.

Alrazaq, A., AlSaad, R., Alhuwail, D., Ahmed, A., Healy, P. M., Latifi, S., Aziz, S., Damseh, R., Alrazak, S. A., & Sheikh, J. (2023). Large language models in medical education: Opportunities, challenges, and future directions. *JMIR Medical Education, 9*(1), e48291. https://doi.org/10.2196/48291

Carvalho, D. V., Pereira, E. M., & Cardoso, J. S. (2019). Machine learning interpretability: A survey on methods and metrics. *Electronics, 8*(8), 832. https://doi.org/10.3390/electronics8080832

Chunpeng Z., Santoso W. and Lily D. L (2024). The effects of over-reliance on AI dialogue systems on students' cognitive abilities: a systematic review. *Smart Learning Environments, 11*(1). https://doi.org/10.1186/s40561-024-00316-7

Darajati, M. R., Reswari, R. A., & Yenny, O. (2023). The Adaptation of Artificial Intelligence (AI) in Social Science Education: Opportunities and Threats. *Bengkoelen Justice: Jurnal Ilmu Hukum, 13*(2), 172–181.

De Angelis, L., Baglivo, F., Arzilli, G., Privitera, G. P., Ferragina, P., Tozzi, A. E., & Rizzo, C. (2023). ChatGPT and the rise of large language models: The new AI-driven infodemic threat in public health. *Frontiers in Public Health, 11*, 1166120. https://doi.org/10.3389/fpubh.2023.1166120

Dergaa, I., Chamari, K., Zmijewski, P., & Saad, H. B. (2023). From human writing to artificial intelligence generated text: Examining the prospects and potential threats of ChatGPT in academic writing. *Biology of Sport, 40*(2), 615–622.

Duhaylungsod, A. V., & Chavez, J. V. (2023). ChatGPT and other AI users: Innovative and creative utilitarian value and mindset shift. *Journal of Namibian Studies: History Politics Culture, 33*, 4367–4378. https://doi.org/10.59670/jns.v33i.2791

Gao, C. A., Howard, F. M., Markov, N. S., Dyer, E. C., Ramesh, S., Luo, Y., & Pearson, A. T. (2022). Comparing scientific abstracts generated by ChatGPT to original abstracts using an artificial intelligence output detector, plagiarism detector, and blinded human reviewers. *BioRxiv*. 2022.12.23.521610

George, B., & Wooden, O. (2023). Managing the strategic transformation of higher education through artificial intelligence. *Administrative Sciences, 13*(9), 196. https://doi.org/10.3390/admsci13090196

Grassini, S. (2023). Shaping the future of education: Exploring the potential and consequences of AI and ChatGPT in educational settings. *Education Sciences, 13*(7), 692. https://doi.org/10.3390/educsci13070692

Hanim, N., Aripin, N., & Lin, N. M. (2020). Exploring the connection between critical thinking skills and academic writing. *International Journal of Asian Social Science, 10*(2), 118–128. https://doi.org/10.18488/journal.1.2020.102.118.128

Hatem, R., Simmons, B., & Thornton, J. E. (2023). Chatbot confabulations are not hallucinations. *JAMA Internal Medicine*. https://doi.org/10.1001/jamainternmed.2023.4231

Ishmatun, N. (2023). The Effect of Artificial Intelligence Tools on Student Learning Motivation in Terms of Rogers Theory. *Journal of Educational Technology and Innovation, 15*(2), 89-104.

Kaeppel, K. (2021). The influence of collaborative argument mapping on college students' critical thinking about contentious arguments. *Thinking Skills and Creativity, 40*, 100809. https://doi.org/10.1016/j.tsc.2021.100809

Komalasari, K. (2020). *The Role of Technology in 21st Century Learning*. Educational Research Press.

Liu, C., Hou, J., Tu, Y.-F., Wang, Y., & Hwang, G.-J. (2023). Incorporating a reflective thinking promoting mechanism into artificial intelligence-supported english writing environments. *Interactive Learning Environments, 31*(9), 5614–5632. https://doi.org/10.1080/10494820.2021.2012812

Lumbantobing, P. A. (2020). The Contribution of Lecturer Pedagogical Competence, Intellectual Intelligence and Self-Efficacy of Student Learning Motivation. *Budapest International Research and Critics in Linguistics and Education (BirLE) Journal, 3*(1), 564–573.

Mbalaka, B. (2023). Epistemically violent biases in artificial intelligence design: The case of dalle-e 2 and starry AI. *Digital Transformation and Society, 2*, 376–402. https://doi.org/10.1108/DTS-01-2023-0003

Ronsumbre, S., Rukmawati, T., Sumarsono, A., & Waremra, R. S. (2023). Pembelajaran Digital Dengan Kecerdasan Buatan (AI): Korelasi AI Terhadap Motivasi Belajar Siswa. *Jurnal Educatio FKIP UNMA, 9*(3), 1464–1474.

Selviana, D. (2023). Digital Learning with Artificial Intelligence (AI): Correlation of AI to Student Learning Motivation. *Journal of Innovative Learning, 8*(1), 45-60.

Serdianus, P. (2023). *Technological Integration in Modern Education Systems*. Academic Publishing House.

Uno, H. B. (2019). *Teori Motivasi dan pengukurannya*. Jakarta: Bumi Aksara.

Watini, S., Latifah, H., Rudianto, D., & Santoso, N. A. (2022). Adaptation of Digital Marketing of Coffee MSME Products to Digital Transformation in the Era of the Covid-19 Pandemic. *Startupreneur Business Digital (SABDA Journal), 1*(1), 19–33.