THE APPLICATION OF LEARNING TECHNOLOGY TO SHAPE THE MOTIVATION OF WRITING LITERACY AND THE FORMATION HABIT OF RURAL STUDENTS IN INDONESIA

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ABSTRACT

Technology-enhanced learning has become an integral part of contemporary education and has a significant impact on students' writing literacy motivation. This research aims to review the level of writing literacy motivation in rural Junior High Schools (SMP) in Indonesia. Additionally, this study aims to examine the relationship between learning technology and students' writing habits. This research employs a quantitative approach with online survey data collection techniques using the Qualtrics system. The analysis technique used in this study utilizes Structural Equation Model-Partial Least Square (SEM-PLS). The test results indicate that learning technology has a significant influence on writing literacy with a path coefficient of 0.614. This suggests that mastery of learning technology provides a positive boost to students' motivation to write. The impact of learning technology on habits and behavior also has a significant direction with a path coefficient of 0.651. The use of technology has increased students' motivation for writing literacy due to easy access to required resources. Participants feel more motivated to explore new topics and ideas and offer opportunities to express themselves through writing.

Keywords: *learning technology, writing literacy, habit and behaviour, rural middle school*

1. INTRODUCTION

In an era filled with technological advancements, the approach to education has undergone significant transformation. One major change that has had a significant

impact is the use of technology as part of the learning process to enhance writing literacy and boost writing motivation among students (Yang et al., 2018). Learning technology, with all its innovations, serves not only as an additional tool but also as a catalyst that expands access, supports personalization, and promotes deeper engagement in the writing learning process (Newell, 2014). In this context, the influence of learning technology on writing literacy and writing motivation has become a focus of attention for education practitioners, researchers, and other education stakeholders (Wijayanti, 2020). This paradigm shift is reflected in efforts to understand how technology can be effectively used to stimulate writing interest and improve students' writing motivation at various education levels (Gomez et al., 2019).

However, alongside the rapid growth of technology, questions arise about the extent of learning technology's influence on literacy and student learning motivation (Rosen, 2009). Some studies indicate that the use of technology can enhance students' interest in writing through interactive multimedia content (Wijayanti, 2020). However, there are concerns as well, such as the potential for digital usage to blur students' focus (Uzelac, 2008). For instance, (Gallardo et al., 2019) illustrate that this rapid technological growth actually distracts learners. Students' literacy habits decline with technological advancement (Giannini & Bowen, 2019). This is because students are more interested in using technology for interaction and communication with their peers rather than academic-related activities (Ameliah et al., 2023; Sari et al., 2023).

The development of technology in Indonesia during the period from 2018 to 2022 reflects positive progress, with a significant increase in the technology development index and internet usage. According to the Central Statistics Agency (BPS, 2023), there was an increase of 0.78 points over the course of five years. Data obtained from Kemp (2019) shows that internet usage in Indonesia also increased by 13% within one year. However, there are still significant disparities in access to and utilization of technology, especially in remote areas. Indonesia still faces challenges in leveling accessibility to technology and information, with technology development centers still primarily focused in Java Island. Data reported by BPS (2023) indicates that eastern parts of Indonesia, such as Papua and East Nusa Tenggara, have lower technology and information development indexes compared to Jakarta.

These disparities reflect challenges that need to be addressed in expanding access to and utilization of technology throughout Indonesia (Jalal, 2005). Additionally, the information-rich digitalization era also brings new challenges in information processing and management (Giannini & Bowen, 2019). These challenges are crucial to understand in efforts to effectively integrate technology into learning environments (Chitondo., 2021). By understanding the challenges faced and the potential of existing technology, steps can be taken to maximize the benefits of technology in the learning context (Rosen, 2009). Efforts to formulate effective strategies for integrating technology into learning are crucial to ensure that the benefits of technology are evenly felt by all Indonesian communities and to address challenges arising from this digitalization era.

Thus, this research will explore the influence of learning technology on writing literacy motivation. This study will also elaborate on how learning technology can provide more detailed measurements of writing literacy progress. Through a deeper understanding of the dynamics outlined, it is hoped that this research can formulate more effective strategies for integrating technology into the learning environment. This will strengthen writing literacy and foster sustainable writing motivation for students at various education levels.

2. LITERATURE REVIEW

Writing Literacy Motivation

Literacy is the process of developing individual knowledge and potential, focusing on understanding, assessing, using, and engaging with written texts (OECD, 2019).

Good literacy skills enable individuals to access information, analyze texts, and make decisions based on a deep understanding of the material read (Esmer & Gunes, 2019). This emphasizes that literacy is not just about technical skills but also about the ability to understand, evaluate, and interpret information found in written texts (Linnakyla et al., 2004). The emphasis on cognitive skills required in the writing process, as expressed by Adams (1990), also indicates that writing is a process that requires various complex cognitive skills.

Several studies reveal that achievement in literacy is influenced by various complex and multidimensional factors (Koyuncu & Firat, 2020). The first influence is fluent writing motivation (Kim et al., 2010) and understanding the structure of texts to help interpret and connect the information read (Pyle et al., 2017). This is because understanding the structure of texts is a form of cognitive construction that plays an active role in individuals (Becker & McElvany, 2010). The use of cognitive and metacognitive strategies plays a crucial role in understanding and managing information obtained from writing texts (Firat & Kocak, 2019). Lastly, high motivation for writing will encourage individuals to actively engage in understanding writing texts (Logan et al., 2011). A deep understanding of these factors can help in developing effective educational strategies to enhance students' holistic writing comprehension.

The connection between students' writing literacy levels and writing literacy has a close and mutually influential relationship in developing someone's language skills (Geske & Ozola, 2008). Individuals with high levels of writing literacy tend to have better understanding of grammar, vocabulary, and sentence structure, which are crucial components in effective writing (Koyuncu & Firat, 2020). Writing books, stories, and various articles can broaden one's imagination and stimulate creativity. This helps in generating new ideas and composing interesting stories or writings (Williams & Bearn, 2017). Good writing literacy can provide inspiration and fuel for someone's writing ability (Gnach et al., 2007). Thus, emphasis on literacy development in schools and other learning environments is an important step in enhancing overall education quality and preparing students for success in various academic and professional aspects (Esmer & Gunes, 2019).

Empirical studies have shown a positive and moderate relationship between intrinsic motivation and literacy (Taboada et al., 2019; Schaffner & Schiefele, 2007). Writing motivation arising from individual interest and enjoyment is considered the most important type of motivation (Schiefele et al., 2012). When individuals feel intrinsic motivation to read, it tends to increase their level of engagement in the writing process, which in turn can lead to improved writing motivation and achievement (Becker et al., 2010; Cartwright et al., 2016). This emphasizes the importance of creating environments that support and cultivate interest and enjoyment in literacy, which ultimately helps improve individuals' writing literacy motivation overall (Yang et al., 2018).

Learning Technology

The use of literacy learning resources facilitated by technology is becoming increasingly important in the field of education (Rusyidah et al., 2020). This is because technology-based learning can present instructional material in contextual, visual, and auditory ways that are engaging and interactive (Chan et al., 2017). In line with Minister of Education Decision No. 22 of 2016 regarding the standards of basic and secondary education processes, information and communication technology must be applied integratively, systematically, and effectively considering conditions and situations in the field (Permendikbud, 2016). By utilizing digital literacy, teachers can present learning materials more dynamically and attractively to students (Rusyidah et al., 2020). This not only makes the learning process more interesting but also helps students to be more engaged and understand the material being taught.

Learning technology creates broader access to a variety of writing resources, such as e-books, online articles, and interactive learning platforms (Rosen, 2009). This innovation can help improve access to diverse writing materials, providing more

options for students to expand their knowledge and deepen their understanding of various topics (Gomez et al., 2019). Learning technology can be packaged interactively and attractively through various media, such as video, audio, animation, and educational games (Gallardo et al., 2019). Packaging learning using technology can increase students' interest and engagement in writing materials. By presenting information through various media, students can have a more varied and engaging learning experience (Chan et al., 2017). This can strengthen students' motivation to read more because engaging learning tends to stimulate students' interest and curiosity in a topic (Booton et al., 2023).
The integration of information and communication technology in the learning process has been proven to help students develop digital skills that are very important in today's era (Gomez et al., 2019). Technology skills are an integral part of the concept of literacy (Cajas, 2002). Thus, literacy here not only encompasses the technical ability to use technology but also a deep understanding of how technology can be effectively used for learning, working, and collaborating (Kyrylova et al., 2023). Therefore, literacy not only involves technical skills but also contextual understanding of the role of technology in everyday life (Sari & Chou-Liu, 2023; Sukmayadi & Yahya, 2020). The importance of technology skills and literacy becomes increasingly relevant in preparing students for a future that is increasingly digitally connected (Light et al., 2009). The ability to use technology wisely and effectively is an important asset that can help students adapt to the developments and changes of the times.

3. RESEARCH METODOLOGY

The sampling method employed in this study utilizes a cross-sectional design. The cross-sectional method is a research approach involving the collection of data at a single point in time from various individuals, groups, or different variables. It aims to provide a representative overview of the situation or the relationship between variables at a specific moment. This approach does not involve collecting data from the same individuals or groups periodically over a certain period of time.
As for the method of analysis used to answer the hypotheses in this study, it is the Structural Equation Model-Partial Least Square (SEM-PLS) with the assistance of SmartPLS3 software. SEM-PLS is a powerful analysis method because it does not assume data with scale measurements and small samples and can be used for nominal, categorical, ordinal, interval, and ratio data (Hair et al., 2017). Additionally, SEM-PLS also has advantages in its flexibility to handle complex models, address multicollinearity, and estimate asymmetric models well. This makes it an ideal choice for research with relatively small samples or when data do not meet the assumptions of normal distribution (Hair et al., 2017).

4. RESEARCH RESULT

Participants in this study are junior high school students in Indonesia, both male and female, studying in rural schools, categorized as 7th, 8th, and 9th graders, aged 12-15 years old. The survey is a self-report survey distributed over 5 months, with a total of 1024 participants, but in this article, respondents who meet the criteria by completing the questionnaire in full are 601 respondents. Below are the results describing the characteristics of the respondents:

Table I. Respondent demographic

Demographic Items	Frequency	Percentage (%)
School		

SMP Negeri 5 Angkona	79	13.1%
SMP Negeri 2 Kalaena	93	15.5%
SMP Negeri 1 Kalaena	190	31.6%
SMP Negeri 3 Kaimana	239	39.8%
	601	100.0%
Gender		
Male	243	40.4%
Female	358	59.6%
	601	100.0%
Grade		
7th	181	30.1%
8th	211	35.1%
9th	209	34.8%
	601	100.0%
Age		
12th	80	13.3%
13th	197	32.8%
14th	214	35.6%
15th	88	14.6%
	601	100.0%
The period of use of learning technology or socio-cultural applications or the like		
0-1 years	136	22.6%
1-2 years	146	24.3%
3-5 years	319	53.1%
	601	100.0%

The research results provide demographic descriptions of participants from four junior high schools in various locations. SMP Negeri 3 Kaimana contributed the most with 41.45%, while SMP Negeri 5 Angkona contributed the lowest percentage with 14.13%. Based on gender characteristics, the majority of participants are female (60.16%), while males contribute 39.84%. In terms of grade level, there is a balanced distribution with 7th grade (28.67%), 8th grade (35.53%), and 9th grade (35.80%) each showing significant contributions. In terms of age, the majority of participants are 14 years old (36.88%) and 13 years old (34.05%), while 15 years old contributes 15.21%. This indicates that the majority of participants are in the middle to late teenage age range.

Table II. Correlation matrix for measurement scales

	Mean	SD	LTA	WLM	HB
LTA	3.89	0.595	**0.719**		
WLM	3.91	0.591	0.644**	**0.714**	
HB	3.91	0.582	0.611**	0.680**	**0.738**

Note: LTA: Learning_Technology_AScL,
WLM: Writing_Literacy_Motivation,
HB: Habits and Behaviour
SD: standard Deviation
Diagonal elements are the square roots of the AVE for each construct

Pearson correlations are shown below the diagonal
Significant at *: $p < 0.05$, **: $p < 0.01$, ***: $p < 0.001$

This correlation table illustrates the relationship between constructs measured in this study. The measurement scales include Learning Technology (LTA), Writing literacy motivation (WLM), and Habits and Behavior (HB). The results show that there is a significant positive relationship between almost all constructs.
The main diagonal of the table shows the square root values of the AVE for each construct, which is a measure of how much variance of the construct variables can be explained by the measurement items. The AVE values are relatively high, indicating that these constructs are well measured by the existing items. When comparing AVE values with correlations between construct variables, it is observed that the AVE for each construct is greater than its correlation with other constructs. This indicates that the variance of the construct is greater than its correlation with other constructs, indicating that the construct can indeed be considered as separate and measurable. These results affirm the reliability and measurement quality in this study, and strengthen confidence in the validity of the analysis results.

Table III. Measurement results

Constructs	Factor Loading	Composite reliability (CR)	Average of variance extracted (AVE)	Cronbach's α
Learning_Technology_AScL				
LTA1	0.696	0.838	0.509	0.758
LTA2	0.766			
LTA3	0.767			
LTA4	0.716			
LTA5	0.612			
Writing_Literacy_Motivation				
WLM1	0.717	0.867	0.544	0.791
WLM2	0.743			
WLM3	0.771			
WLM4	0.723			
WLM5	0.734			
Habits and Behaviour				
HB1	0.780	0.842	0.518	0.758
HB2	0.735			
HB3	0.744			
HB4	0.684			
HB5	0.647			

Additionally, the validity and reliability tests of the questionnaire for each construct can be observed in the measurement results presented in Table III, which show factor loadings, Composite Reliability (CR), Average of Variance Extracted (AVE),

and Cronbach's α for each construct variable in this study. High AVE values indicate that most of the variance of the construct is explained by the measurement items, and high Cronbach's α indicates the reliability of the construct measurement.

1. Learning Technology (LTA): This construct variable has three measurement items (LTA1, LTA2, LTA3, LTA4, LTA5). Each item has significant factor loadings, indicating that these items effectively reflect the Learning Technology construct. The high Composite Reliability (CR) also indicates that this construct is well measured. The high AVE values indicate that most of the variance of the construct is explained by the measurement items, and the high Cronbach's α indicates the reliability of the measurement of this construct.
2. Writing literacy motivation (LM): This construct has three measurement items (WLM1, WLM2, WLM3, WLM4, WLM5). These items have significant factor loadings. High CR and AVE values indicate that this construct is well measured.
3. Habits and Behavior (HB): This variable is measured by five items (HB1, HB2, HB3, HB4, HB5). The factor loadings for these items are significant. High CR and AVE values indicate the reliability and validity of the Habits and Behavior construct.

The measurement results indicate that all construct variables in this study are well measured by their measurement items, with high values of CR, AVE, and Cronbach's α. This indicates the reliability and validity of the measurement for each construct variable in this study.

Goodness of Fit Test

	R Square	GoF
Writing literacy motivation	0.377	0.457
Habits and Behaviour	0.423	

The results of the goodness of fit evaluation show the extent to which the developed model can explain the variability of the independent (X) and dependent (Y) variables. The goodness of fit evaluation results indicate how well the estimated model fits the observed data. Here is the interpretation of the results:

- For the WLM variable, the R Square value is 0.377. This means that approximately 37.7% of the variability in the WLM variable can be explained by the LTA variable, while the rest is influenced by variables outside the model.
- For the HB variable, the R Square value is 0.423. This means that approximately 42.3% of the variability in the HB variable can be explained by the LTA variable, while the rest is influenced by variables outside the model.
- The value of GoF (goodness of fit) ranges from 0 to 1, with the interpretation of the value being >0.1 (small GOF), >0.25 (moderate GOF), and >0.36 (good GOF). The GoF value in this research model is 0.457, which means it has a good GoF.

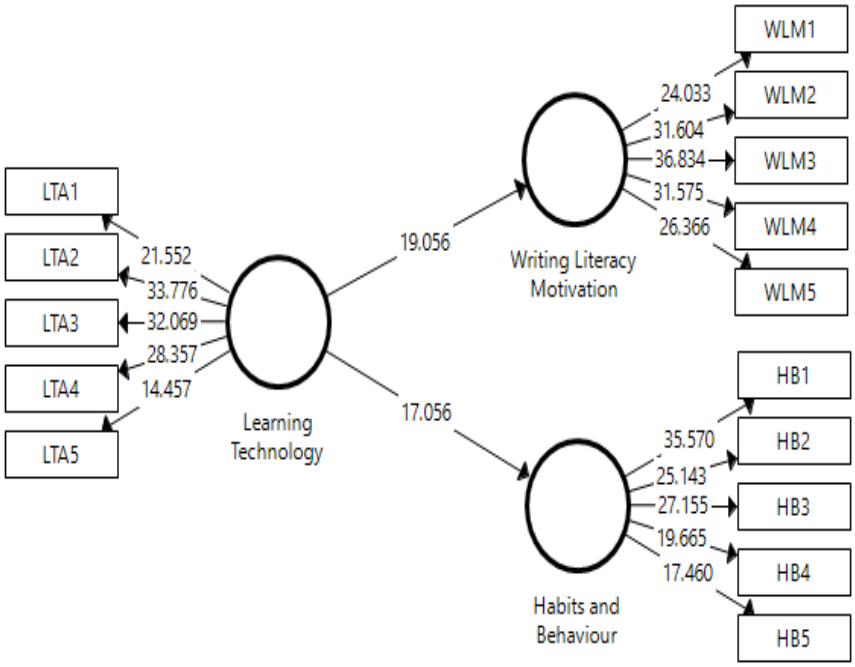

Figure 1. Conceptual Model

Table V. Proposed model results

Hypotheses	Path			Coefficients	T	Test results
H1	Learning Technology ASCL	□	Writing Literacy Motivation	0.614	17.06	Supported
H2	Learning Technology ASCL	□	Habits and Behaviour	0.651	19.06	Supported

Table V presents the results of hypothesis testing for the proposed model in this study. Here are the detailed results of the hypothesis tests:

a. H1 (AScL learning technology → Writing literacy motivation
The test results indicate that AScL learning technology has a significant influence on writing literacy motivation (T>1.96). The influence has a positive direction with a path coefficient of 0.614. This result means that mastery of learning technology with a focus on cultural and social literacy provides a positive boost to students' motivation to write. By utilizing technology related to cultural literacy, students are more likely to be motivated to deepen their writing skills.
The test results showing a significant influence of AScL learning technology on writing literacy motivation provide valuable insights into the potential of

technology in the educational context. With the right approach, learning technology can be a powerful tool in enhancing students' writing skills and fostering their interest in learning. However, the use of technology should be carefully considered and tailored to the needs and learning contexts of students to ensure its effectiveness.

b. H2 (AScL learning technology → Habits and Behaviour)
The test results indicate that AScL learning technology has a significant influence on habits and behavior (T>1.96). The influence has a positive direction with a path coefficient of 0.651. This indicates that mastery of learning technology with a focus on cultural and social literacy enriches students' habits and behavior. In an era where technology is becoming increasingly important in the learning process, understanding how learning technology can influence students' habits and behavior is highly relevant.
The use of AScL learning technology focusing on cultural and social literacy provides new opportunities to transform and enrich students' habits and behavior. The test results showing a significant influence of AScL learning technology on students' habits and behavior demonstrate the great potential of technology in shaping more effective and meaningful learning. By using this technology wisely and purposefully, educators can harness the power of technology to help students acquire positive habits and behavior, thereby enhancing their overall learning experience and outcomes.

5. DISCUSSION

Learning Technology as Literacy Media

Technology has brought about fundamental changes in the world of education, especially in the context of learning. These changes not only affect how we access information but also have a significant impact on students' motivation, habits, and writing behavior. Technology acts as a mediator that stimulates imagination to generate new ideas and strengthens students' independence during the learning process (Norouzi, 2021). Furthermore, technology-supported learning encourages critical thinking processes in students, which potentially enhances their academic achievement (Hidajat et al., 2023). Through technology, students have broader access to educational resources, including learning materials, writing materials, and writing tools (Zarycka et al., 2021). This enables them to explore various topics and express their ideas in a more creative and innovative manner. With technology, students can also learn independently and develop their writing skills without relying on traditional learning environments.

The research findings indicate a significant relationship between the use of technology in writing literacy and literacy motivation. This confirms that mastery of learning technology can provide a positive boost to students' motivation to write. Consistent with the findings of Kyrylova et al. (2023), which highlight that learning technology has great potential to enhance students' motivation in writing. Through the use of various technological tools and platforms, students can experience more engaging and interactive writing experiences. The use of technology can also help students feel more connected to the topics they write about and provide opportunities to explore various social and cultural aspects related to those topics (Light et al., 2009). Furthermore, the use of technology is no longer just a process of pouring out ideas but also evolves into a framework for writing (Turner & Katic, 2009). Technology assists students in becoming more engaged in the writing process, expanding their understanding of the topics being discussed, and providing space for creative exploration in their writing expression.

The use of technology must be directed effectively and sustainably. A planned and targeted approach to integrating technology in writing literacy can ensure that students are truly engaged and motivated to write actively (Rose et al., 2015). Educators need to consider various factors, including the selection of platforms or applications that are suitable for students' needs and interests, as well as providing constructive guidance and feedback to help them develop their writing skills

(Dangprasert, 2023). Another issue to be addressed is ensuring the absence of a technology and information access gap between rural and urban areas (Turner et al., 2020). Therefore, educators need to develop appropriate strategies to integrate technology in learning to maximize its benefits while overcoming potential risks and barriers (Sukmayadi & Yahya, 2020). Thus, it is important for educators to realize the potential of technology in enhancing students' motivation to write, while paying attention to effective strategies in its application (Zarycka et al., 2021). With the right approach, learning technology can become a powerful tool in strengthening students' writing literacy and stimulating their interest in exploring the world of writing more deeply.

It is important to pay attention to how technology is applied in shaping positive habits in students' writing literacy, despite its advantages in enhancing literacy motivation (Sari & Chou-Liu, 2023; Williams & Bearn, 2017). Research results indicate a significant relationship between the use of technology in shaping students' writing habits. The flexible nature of technology opens up opportunities for students to express ideas and concepts in various ways (Gnach et al., 2007). They can use various platforms to share their writings and receive feedback from fellow writers. The feedback received is a crucial element in continuously improving the quality of students' writing. Through feedback, students have the opportunity to refine and develop their writing skills (Lenhart et al., 2008). The presence of this feedback is one of the advantages of using technology in writing literacy.

Students can also collaborate in the writing process, provide feedback to each other, and learn from others' writing experiences. Collaboration among students not only enriches the learning experience but also allows them to sharpen their writing skills together (Turner et al., 2020). Additionally, through technology, students can deepen their understanding of grammar, writing structure, and the use of appropriate writing styles (Mills, 2011). With interactive and collaborative learning experiences, students can feel naturally motivated to write (Sari et al., 2024; Turner et al., 2020). The integration of technology in writing instruction has a significant positive impact on shaping students' writing habits (Williams & Bearn, 2017). A wise approach to using technology not only strengthens students' writing skills but also stimulates their interest in exploring the world of writing more deeply and diversely (Gnach et al., 2007). Thus, learning technology can be an effective tool in strengthening students' writing skills and fostering sustained interest in writing literacy.

6. CONCLUSIONS

The use of learning technology has brought significant changes in students' motivation regarding writing literacy. Integrating technology into writing instruction has boosted students' motivation by providing easy access to learning resources. Students feel more motivated to explore new topics and ideas and are offered opportunities to express themselves through writing. Quick and measurable feedback from technology allows students to see their progress more clearly and provides opportunities to improve their writing skills directly.

However, it is important to note the negative impacts of technology use in writing instruction, such as distractions from social media or confusion due to too many options. Therefore, educators need to take a balanced approach to integrating technology into writing instruction, ensuring that its use supports and enhances student motivation rather than hindering it. Overall, learning technology has opened doors for significant development in students' writing skills. By harnessing the potential of technology wisely and being aware of the associated challenges, it can continue to advance students' motivation and writing skills to meet the demands of an increasingly digital and interconnected world.

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