

**The Mediating Role of Work Motivation in the Impact of Training
on Teachers' Digital Literacy**

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Abstract

It is importance of improving the digital literacy of teachers is crucial with the rapid integration of technology in education, effective training programs are critical. However, their success largely depends on the motivation of the participants. The purpose of this study is to determine the mediating role of the work motivation variable on the effect of the training variable on the digital literacy variable so that there are two independent variables and one dependent variable. The number of samples used was 73 teachers in Palembang. To collect data, a questionnaire technique was used. Using the Smart PLS 3.0 structural equation modeling technique, the hypothesized relationships in this study were tested. This study found that: 1) training had a positive and significant effect on teacher motivation; 2) work motivation had a positive and significant effect on teacher digital literacy; 3) training had a positive and significant effect on teacher digital literacy; and 4) work motivation had a mediating effect on the relationship between training and teacher digital literacy. These results highlight the importance of fostering a motivational climate to maximize the benefits of training programs. Implications for educational policy and practice are discussed, emphasizing the need for strategies that not only provide training but also actively engage and motivate teachers to enhance their digital competencies.

Keywords: digital literacy, mediating, training, work motivation

INTRODUCTION

The influence of digital technology development is increasingly widespread in various aspects of life, including in the education sector (Diao et al., 2023). The development of technology has led to efforts to transform education. Especially since the Covid-19 attack, educators have struggled to adapt to the changes and try to utilize technology in the implementation of the learning process (Sihite & Rangkuti, 2023). Teachers face pedagogical challenges that require them to adapt to new expectations in terms of communication, teamwork, and knowledge acquisition (Judijanto, 2024). In addition, technological developments enable educators to create interactive learning environments and utilize multimedia tools to enhance the educational experience and achieve a more effective and efficient quality of education, but there are many challenges in integrating technology in education. There are several factors that become challenges in integrating technology in learning, such as the attitudes and beliefs of teachers, their limited ability to operate technology, and the digital literacy skills of teachers (Nurhidayat et al., 2022).

The education era in the 21st century requires teachers to have adequate digital literacy to optimize the benefits of technology in achieving the learning process (Utama et al., 2020). This is especially relevant given the rapid development of information and communication technology that continues to change the educational landscape. Teachers who have good digital literacy can be agents of change who are able to create innovative and adaptive learning environments in accordance with the demands of the times (Nguyen et al., 2022). Digital literacy is not just the ability to use digital devices and applications but also includes a deep understanding of how these technologies can be used effectively and beneficially in an educational context (Diao et al., 2023). Digital literacy is an important part of the process of developing the professionalism of teachers, as they perform various tasks involving the use of digital technologies, such as preparing students to meet the demands of the time (Stoika, 2023). Digital literacy is also an important aspect in the vision of 21st-century education to deal with changing working and living conditions that require new skills (Weninger, 2017). Hague & Payton (2010) explained that digital literacy has 8 components: functional skills, e-safety, critical thinking and evaluation, collaboration, effective communication, cultural and social understanding, creativity, and the ability to find and select information. Digital literacy is a necessary skill in adapting to technology. But in fact, Indonesia's digital literacy is not yet good. The digital literacy of teachers in Indonesia is one aspect that needs to be addressed (Arsy et al., 2023; Silvana & Dermawan, 2022). Therefore, efforts to improve teachers' digital literacy are one of the efforts that support the optimization of the function of technology in education. For this reason, this research focuses on the area of teacher professional development, specifically related to digital literacy.

Integrating innovative technologies during classroom practice is a challenge for teachers who are required to have new technological and pedagogical skills, which causes teachers to need training in developing their digital competence (Karunanayaka & Weerakoon, 2020). Training is one of the effective activities in achieving a way to develop teachers' professional skills (Khairiah et al., 2024; Tsatsou, 2018). Training is an activity that is systematically designed as an effort to increase knowledge, skills and expertise so that it is useful for achieving better professional performance (Neza & Rivai, 2020). The results of research conducted by Eryansyah et al. (2020) show that low digital literacy is caused by the unavailability of related training. For this reason, training is very important in achieving digital literacy in facing and adapting to the demands of the world

of work (Jatmoko et al., 2023). According to Dessler (2011), training indicators consist of instructors, trainees, training methods, training materials, and training objectives.

In the effort to achieve something new, both good performance and new skills, there must be encouragement from both within and without the individual. This drive is called motivation (Seebaluck & Seegum, 2013). Motivation affects a person's energy as a drive to learn, work effectively and achieve potential so that motivation determines what activities are done or not done, how long they are involved in these activities and the extent to which they are involved in an activity (Sinclair, 2008). This shows that motivation plays an important role in achieving good digital literacy. A person's work motivation can be based on the principle of human needs. When these needs are met, job satisfaction is created (Nurjanah & Suherman, 2022). Research conducted by Anistyasari et al. (2024) revealed that a person's intrinsic motivation has a significant impact on digital literacy. Teacher work motivation is divided into intrinsic and extrinsic motivation. Indicators for intrinsic motivation consist of 1) a sense of responsibility for work, 2) enthusiasm for achieving job satisfaction; 3) self-development efforts, and 4) enthusiasm for improving living standards. Meanwhile, indicators for extrinsic motivation consist of 1) appreciation, recognition, and confidence in doing work, and 2) communication with coworkers (Suyitno et al., 2023).

The importance of digital literacy is closely linked to broader educational goals such as the development of 21st century skills in students. Teachers with good digital literacy skills serve as role models and drivers for fostering technological literacy in the next generation. Therefore, investing in improving teachers' digital literacy through training and motivation not only benefits educators personally, but also contribute to the broader goals of educational institutions striving to excel in the digital age. Previous studies have shown that training or motivation have an impact on improving digital literacy. The finding from Lilian (2022) shows that there is positive and significant relationship between motivation and digital literacy competency. The study from Hobbs & Tuzel (2017) shows that teachers' digital learning motivation profiles and their subject-area specialization showed statistically significant correlations. Research conducted by Albaar et al. (2023) shows a direct relationship between a teacher's performance and motivation and their level of certification. Performance can therefore be enhanced by enhancing the implementation of teacher certification and by encouraging achievement. The study from Okoed et al. (2024) discovered that the teachers' abilities and knowledge in technology were much enhanced by the digital literacy training.

However, there is a gap in the literature examining how work motivation can act as a mediator in the relationship between training and digital literacy. Previous research has largely focused on the direct relationship between training and skill outcomes or digital literacy without considering the mediating role of motivation. This gap suggests the need for further research to understand the mechanisms through which work motivation affects the effectiveness of digital literacy training. The research of Nurhalim & Fahmy (2021) shows that motivation plays a partially moderating function in the link between employee performance and training. This study aims to fill this gap by examining the mediating role of work motivation in the relationship between training and digital literacy. By investigating how motivation affects the effectiveness of training programs, this study aims to provide valuable insights in designing more effective training interventions that not only provide digital literacy skills but also improve teachers' work motivation.

This article aims to further explore the relationship between training, motivation, and digital literacy among educators, drawing on insights from empirical research and educational theory. By synthesizing existing literature and empirical evidence, we seek to illuminate the pathways through which training and motivation influence teachers' digital literacy levels. In addition, this research will offer practical implications for policymakers, educational administrators, and professional development practitioners seeking to optimize strategies for improving digital literacy among educators. Understanding and addressing the factors underlying the effective integration of technology in education is critical to creating a competent cohort of educators in the digital age who are able to meet the diverse needs of today's learners. From the explanation above, the hypothesis of this study is formulated as follows:

H₁: There is a positive and significant influence between training variables on teacher motivation.

H₂: There is a positive and significant influence between motivation variables on teachers' digital literacy.

H₃: There is a positive and significant influence between training variables on teachers' digital literacy.

H₄: Work motivation plays a role in mediating the relationship between training and teacher digital literacy.

METHOD

The purpose of this study was to determine the mediating role of the Work Motivation variable on the effect of the Training variable on the digital Literacy variable so that there are two independent variables and one dependent variable. The training variable that aimed to measure the level of involvement and effectiveness of the training attended by teachers was the first independent variable. This was measured by 5 indicators, namely instructors, trainees, training methods, training materials, and training objectives. The second independent variable was Work Motivation. The variable that measured how much the level of work motivation of teachers in carrying out their duties and responsibilities was measured through 6 indicators, namely 1) a sense of responsibility for work, 2) enthusiasm for achieving job satisfaction; 3) self-development efforts, and 4) enthusiasm for improving living standards, 5) confidence in doing work, and 6) communication with coworkers. Furthermore, the independent variable in this study was the Digital Literacy variable. This variable aimed to measure how well teachers understand, use, and utilize digital technology in the context of education. The Digital Literacy variable was measured through 8 indicators, namely 1) functional skills, 2) e-safety, 3) critical thinking and evaluation, 4) collaboration, 5) effective communication, 6) cultural and social understanding, 7) creativity, and 8) the ability to find and select information.

Data was collected through an online questionnaire distributed through Google form to middle school teachers in Palembang City and 72 teachers have participated in this survey. Data was collected in April 2024 and processed in May 2024. Structural Equation Modeling (SEM) analysis with Partial Least Squares (PLS) was used in this study to analyze the mediating role of Work Motivation on the effect of Training on teacher Digital Literacy. SmartPLS (3.0) has been utilized in this study to perform variance-based partial least squares structural equation modeling (PLS-SEM). The measurement model and structural model are the two steps in the analysis that make up this method. While the structural model examines every hypothesis and path analysis, the

measurement model measures the latent variables. Because the goal of the study was prediction-oriented, PLSSEM was appropriate (Achjari, 2004).

FINDINGS AND DISCUSSION

Findings

The research sample was described with 2 criteria, namely gender and the level of the institution where teaching. The distribution of respondent descriptions can be seen in Table 1.

Table 1. Respondent Profile

Attribute	Description	Frequency	Percentage
Gender	Men	21	29%
	Women	52	71%
Institutional level	Junior High School	13	18%
	Senior High School	46	63%
	Vocational School	14	19%

After tabulating the results of filling out the distributed questionnaires, it was found that out of a total of 73 respondents, there are 21 male teachers and 52 female teachers. In addition, the majority of the respondents are senior high school teachers, namely 56 people or 63 percent. The rest came from Junior High School, namely 13 teachers and 14 teachers from Vocational School.

Measurement Model

If the validity and reliability values of the model’s constituent indicators are high, the model can be effectively employed as a predictor. The construct formed by the indicators was evaluated, According to Achjari (2004), an indicator is generally considered a good variable measure if the external load is more than 0.70. The result of the measurement is shown in Figure 1.

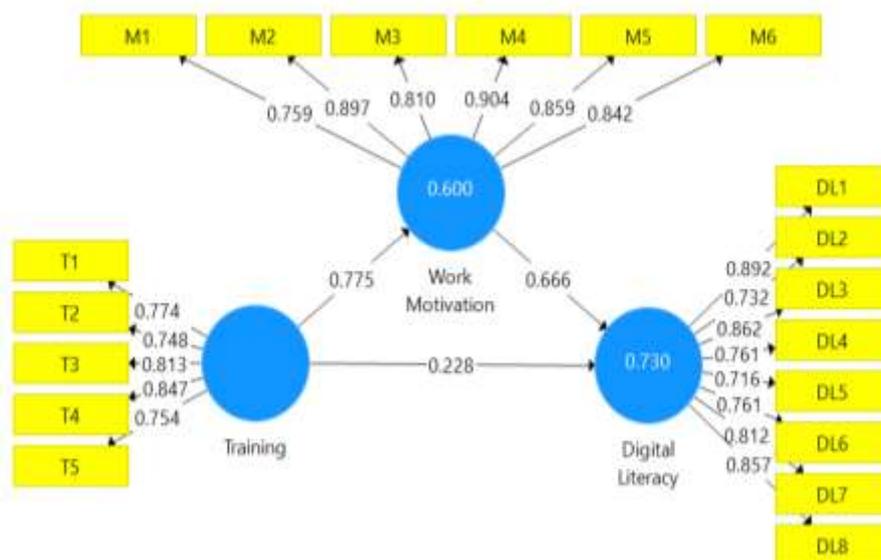


Figure 1. Loading Factors

Figure 1 shows the result of data processing using the Smart-PLS 3 application shows that the value of all loading factors of each variable indicator has a value of > 0.7 , which means that each variable indicator with a total of 19 indicators can be categorized as good in measuring variables (Achjari, 2004).

Furthermore, the results of the discrimination validity analysis are presented in Table 2 below. The value of discrimination validity shows the level of difference in the concept of each construct or latent variable with other variables. The model exhibited strong discriminant validity if the measuring item's correlation with the construct was higher than the construct's correlation value (Fornell & Larcker, 1981).

Table 2. Validity of variable discrimination in research

	Digital Literacy	Training	Work Motivation
Digital Literacy	0.801		
Training	0.744	0.788	
Work Motivation	0.842	0.775	0.847

The Fornell-Lacker test result is shown in Table 2. All of the constructs or latent variables employed in the model have excellent discriminant value validity, as can be seen from the table, where the correlation value of each construct is greater than the correlation value with other constructs.

Model Structure Measurement

R-square values will therefore be used to calculate the model's explanatory power. If the R² value was less than 0.25, the model was considered poor; if it was between 0.50 and 0.75, the model was considered moderate; and if it was larger than 0.75, the model was considered strong as a predictor (Sarstedt et al., 2014).

Table 3. R-Square

	R Square	R Square Adjusted
Digital Literacy	0.730	0.723
Work Motivation	0.600	0.594

Table 3 shows the value of the R-Square of this model. It shows that all the values (0.730 and 0.600) are higher than 0.5 so it can be categorized as moderate. The coefficient of determination for Digital Literacy is 0.730, which means that the model's ability to predict the effect of the Training variable on Digital Literacy is 73%. Furthermore, the R² value for the Work Motivation variable is 0.600 which indicates that the model's ability to predict the effect of the Training variable on Work Motivation is 60%. Therefore, it can be said that both models are sufficiently reliable to be able to predict the relationship between the variables under investigation.

Hypothesis Testing

The path coefficient value was used to test the hypothesis. Figure 2 and Table 4 below show the result of Hypotheses Tested.

Table 4. Results of Hypotheses Tested

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Training -> Digital Literacy	0.228	0.230	0.099	2.295	0.022
Training -> Work Motivation	0.775	0.780	0.048	16.043	0.000
Work Motivation -> Digital Literacy	0.666	0.665	0.095	7.042	0.000
Training -> Work Motivation -> Digital Literacy	0.516	0.514	0.079	6.559	0.000

1. The first Hypothesis stated that the Training had a direct effect on Work Motivation. Table 4 above shows that $\beta=0.775$ and $p(0.000) < 0.05$. It was found that Training had a positive and significant impact on Work Motivation
2. The second Hypothesis states that Work Motivation had a direct effect on Digital Literacy. Table 4 above shows that $\beta=0.666$ and $p(0.000) < 0.05$. It was found that Work Motivation had a positive and significant impact on Digital Literacy.
3. The third Hypothesis stated that the Training had a direct effect on Digital Literacy. Table 4 above shows that $\beta=0.228$ and $p(0.022) < 0.05$. It was found that Training had a positive and significant impact on Digital Literacy.
4. The fourth Hypothesis states that Work Motivation plays a role in mediating the relationship between Training and Digital Literacy. Table 4 above shows that $\beta=0.516$ and $p(0.000) < 0.05$. It was found that Training influences in an important indirect way the Digital Literacy of teachers through Work Motivation. This means that increasing Training can increase Work Motivation and result in increased teacher Digital Literacy as well.

The result of of Hypotheses Tested also can be seen on the Figure 2.

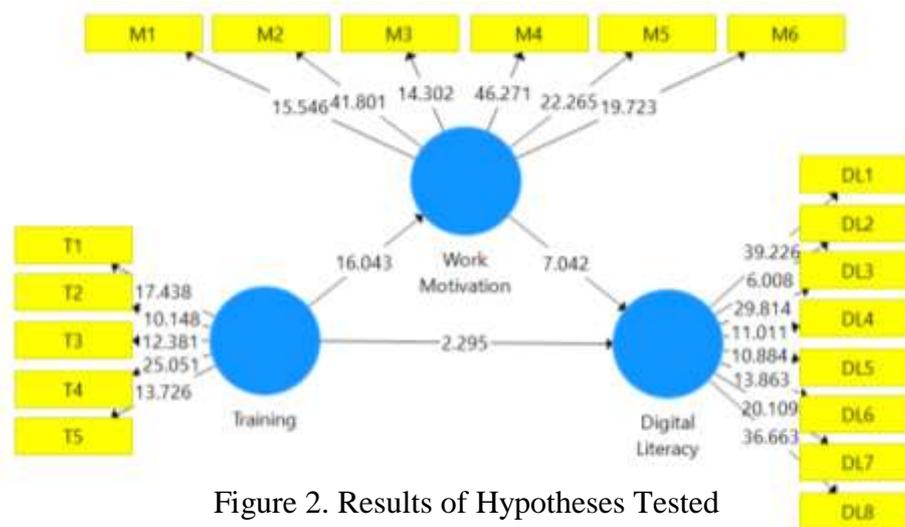


Figure 2. Results of Hypotheses Tested

Discussion

According to the SEM-PLS model analysis, it can be seen that all the Hypotheses are accepted. Training variable, with a path coefficient of 0.228, had a positive and significant effect on the Digital Literacy variable. Digital Literacy increased by 0.228 units if the Training score rose by one unit. These findings clarified why teacher training is important for teacher development, especially in achieving a new skill or competency including digital literacy. This finding is supported by research conducted by Mahapatra (2020) and Záhorec et al. (2019) who found that training programs affect teachers' skills in using digital tools and digital literacy. This finding is relevant to Okoed et al. (2024) that state that training had positive impact on the skills and knowledge of teachers. Thus, this finding is consistent with and confirms the results of previous research which found that training affects teachers' digital literacy. With the results of this study, hopefully, it can be a reference for the government, school leaders, and teachers themselves to be more active in making or participating in training, especially in ICT. Training will be a necessity that will never be enough to do once. Along with the development of the era, various new demands will also emerge. So, to respond to these new demands and challenges it is necessary to keep up with various trainings. School officials must also be sensitive to the needs of their teachers for relevant training so it is also necessary for principals to facilitate training for teachers.

The Training variable also has a positive and significant effect on the Work Motivation variable. The researcher did not find much literature that revealed the effect of training on teachers' work motivation, but this is in accordance with the research of Arta et al. (2022) that found the same result. Through training, teachers are introduced to the latest teaching methods and technologies that help them deal with evolving teaching challenges, thus increasing their motivation to implement these methods in the classroom. Training provides variety and new challenges that help overcome boredom and stagnation in work routines, making teachers feel more engaged and motivated to give their best in their work (Alonso-garcía, 2024). In addition, well-designed training can also fulfill teachers' basic psychological needs, such as the need for rewards and recognition. When teachers feel recognized and supported through training, they are likely to experience increased extrinsic motivation. Recognition of their efforts and achievements during training can strengthen their commitment to their work and encourage them to continue developing professionally (Henderson & Corry, 2021; Pazilah et al., 2024).

Furthermore, the results showed that the Work Motivation variable also has a positive and significant impact on Digital Literacy. This is supported by research conducted by Lilian (2022) that conduct the same result. A teacher must have strong motivation because work motivation affects the ability of a teacher (Okoed et al., 2024). Motivated teachers have an internal drive to keep learning and developing new skills, including in technology. They are more open to innovation and more enthusiastic in exploring and adopting new digital tools and platforms that can support the learning process. Perseverance in facing technological challenges also increases with high work motivation, so teachers are more persistent in overcoming barriers. High work motivation also correlates with increased satisfaction and performance, where good digital literacy can improve teaching efficiency and effectiveness (Alonso-garcía, 2024). In addition, strong motivation makes teachers more adaptable to change, including the integration of technology in education. In a positive and collaborative work environment, high work motivation can be contagious, encouraging teachers to share digital knowledge and skills with their peers, thus improving overall digital literacy in the education environment

With a beta value of 0.516, the PLS model analysis results showed that Work Motivation variable had a mediating effect in influencing how the Training affected teachers' Digital Literacy. The researcher has not found similar research that discusses the mediating role of work motivation on the effect of training on digital literacy. The results of this study show that work motivation acts as a mediator in the relationship between training and teachers' digital literacy. This finding indicates that training not only directly improves teachers' digital literacy but also has an indirect impact through increasing their work motivation. In other words, effective training can increase teachers' work motivation, which in turn strengthens their digital literacy. Well-designed training provides teachers with new knowledge and practical skills relevant to digital needs in modern education. When teachers feel more competent and confident in using digital technologies, their intrinsic motivation to learn and develop themselves further also increases (Dwapatesty et al., 2021). This feeling of competence is one of the key factors influencing intrinsic motivation, where teachers feel motivated from within to teach and apply new skills in the classroom environment.

This study makes an important contribution to the existing literature by exploring the mediating role of work motivation in its impact on teachers' digital literacy through training. This offers a new perspective in understanding how training can improve digital literacy by strengthening teachers' intrinsic and extrinsic motivation. However, this study also has some weaknesses that need to be considered. One of the main weaknesses is the limitation in the generalizability of the findings. The research sample may not be representative of the wider population, so the results may not be generally applicable to all educational contexts. In addition, the cross-sectional nature of this study does not capture dynamic changes in digital literacy and teacher motivation over time. A longitudinal study would be ideal to understand these changes in more depth. Finally, although the instruments used have been validated, there is always the potential for bias in measurement, especially in terms of self-reporting from respondents which can be influenced by various subjective factors.

Future research should also use a larger and more diverse sample in terms of geography, education level and school type (public and private) to improve the generalizability of the findings. In addition, qualitative approaches such as in-depth interviews or focus group discussions can be used to dig deeper into teachers' experiences and perceptions of training, work motivation and digital literacy, which can reveal nuances and contextual factors that may not be identified through quantitative surveys. Overall, despite some limitations, this study still provides valuable insights and a solid foundation for further research in the field of digital literacy and teacher professional development.

CONCLUSION

The results of the SEM-PLS analysis concluded that teacher training and work motivation positively and significantly influenced teachers' digital literacy. This finding also explains the positive and significant relationship in the indirect effect of training on digital literacy mediated by work motivation. Specifically, well-designed training not only improves teachers' digital skills directly, but also increases their work motivation, which in turn strengthens their digital literacy. The better training a teacher goes through can increase teacher work motivation which will ultimately impact on better teacher digital literacy as well. This finding confirms the importance of training in the context of teacher professional development, where increased work motivation plays an important

role in maximizing the effectiveness of such training. So, both variables need to be improved to achieve the good of Digital Literacy. This finding is useful for policymakers, school leaders, and teachers themselves in an effort to increase the intensity of training and work motivation to achieve new skills to support the achievement of more effective and efficient education quality. However, there is still a need for in-depth research on other aspects that can affect teachers' digital literacy.

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