International Journal of Business, Law, and Education
E-ISSN : 2747-1349
Publisher: IJBLE Scientific Publications Community Inc.
Volume 6, Number 1, 2025
https://ijble.com/index.php/journal/index

The Influence of Teacher Competence and the use of Interactive Wordwall Media on Early Literacy Abilities of Early Childhood

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ABSTRACT
This study aims to reveal the Influence of Teacher Competence and the Use of Interactive Wordwall Media on Early Childhood Literacy Skills. This study is a quantitative study with a survey approach. The population in this study were Kindergarten students at the Selaras Auladia Foundation, North Cikarang. This study used a saturated sample of 50 early childhood children. The research data was obtained through valid and reliable instruments. This study aims to analyze the Influence of Teacher Competence and the Use of Interactive Wordwall Media on Early Childhood Literacy Skills. The trial of the Teacher Competence instrument obtained a reliability of 0,784 and the interactive wordwall media instrument obtained a reliability of 0,788. The results of the analysis show that teacher competence has a positive effect on early childhood literacy skills, and the use of interactive wordwall media has a positive effect on early childhood literacy skills. Teacher competence and the use of interactive wordwall media together have an effect on early childhood literacy skills.

Keywords:
Keywords: teacher competence, interactive wordwall media, Children's literacy

INTRODUCTION

The rapid development of digital technology has significantly transformed various aspects of society, including the field of education. In the current digital era, it is essential to prepare children early on to navigate technological advancements and acquire critical skills. One fundamental aspect of this preparation is ensuring that children develop strong literacy skills, which include the abilities to read, write, and interact effectively. Early childhood education is a key phase for laying the groundwork for cognitive, social-emotional, and language development, enabling children to excel in the digital landscape (Wahyuni, 2023). According to Vygotsky (1978), early learning plays a crucial role in shaping cognitive development, while Piaget (1952) emphasizes that the early childhood stage is pivotal in constructing mental schemas. Moreover, the concept of literacy extends beyond traditional reading and writing to include digital literacy, which enables children to interact with digital technologies competently (Cikal, 2024). Additionally, Bronfenbrenner's (1979) ecological systems theory highlights the importance of environmental influences, including early childhood education, in shaping a child's learning trajectory.

The development of literacy skills in early childhood is critical for building a foundation for future cognitive and social development. Early literacy activities, such as reading stories and engaging in conversations, support the growth of language, comprehension, and problem-solving skills. These activities help children understand the world around them and contribute to their cognitive abilities (Olenka, 2024). According to Snow (2010), early literacy is a predictor of future academic success, as it enhances vocabulary and language fluency. Furthermore, literacy fosters creativity and critical thinking, both of which are essential skills in the digital age (Kemendikbud PAUD Teacher, 2024). The importance of literacy in early childhood education is also highlighted by Whitehurst and Lonigan (1998), who argue that early language skills

play a significant role in children's long-term educational outcomes. In addition, research by Berita Magelang (2024) indicates that early literacy activities contribute to the development of cognitive skills, such as memory, attention, and reasoning.

In response to the technological advancements of the modern era, teachers must develop new competencies to integrate digital tools effectively into their teaching practices. Teachers are expected not only to possess subject knowledge but also to use digital technology to enhance the quality of learning and engage students in meaningful ways. Digital competence is an essential skill for teachers in the 21st century, allowing them to create innovative and interactive learning environments (Cabdindikwil, 2024). The TPACK framework (Mishra & Koehler, 2006) emphasizes the intersection of technological, pedagogical, and content knowledge, illustrating how teachers must blend these elements to provide effective instruction. Similarly, the SAMR model (Puentedura, 2006) outlines stages of technology integration, ranging from substitution to redefinition, helping educators identify how technology can enhance learning experiences. Moreover, teachers' ability to adapt to digital tools supports the development of 21st-century skills, as proposed by Saavedra and Opfer (2012), which are crucial for preparing students for future challenges. This approach aligns with the pedagogical competence described in Permendiknas No. 19 of 2005, which emphasizes the importance of teachers' ability to manage learning effectively.

One innovative tool that aligns with contemporary educational trends is interactive Wordwall media, a web-based application designed to create interactive learning experiences for students. Wordwall offers various interactive activities such as word matching, puzzles, and quizzes that engage children in a fun and educational manner (Kunto, 2020). The use of interactive media in education is supported by the Constructivist Learning Theory, which posits that learners construct knowledge actively through hands-on experiences (Bruner, 1960). According to Mayer's (2009) cognitive theory of multimedia learning, the use of multimedia tools, such as Wordwall, can enhance learning by engaging both verbal and visual channels in the brain, leading to better retention and understanding. Additionally, the social cognitive theory by Bandura (1986) emphasizes the importance of interactive media in promoting active learning, as it encourages children to engage in social and cognitive processes while using technology. Furthermore, according to the Technology Acceptance Model (Davis, 1989), teachers' willingness to adopt and use digital tools, like Wordwall, depends on perceived ease of use and perceived usefulness, highlighting the need for effective teacher training and support.

This study aims to examine the impact of teacher competence and the use of interactive Wordwall media on the early literacy abilities of young children. By exploring the interaction between teacher digital competence and the use of interactive learning tools, this research will contribute valuable insights into how digital technologies can enhance literacy development in early childhood education. The findings of this study will be informed by the Theory of Planned Behavior (Ajzen, 1991), which suggests that teachers' intentions to integrate technology in the classroom are influenced by their attitudes, subjective norms, and perceived behavioral control. Additionally, the research will be guided by the Diffusion of Innovations Theory (Rogers, 2003), which examines how new technologies, such as interactive Wordwall, are adopted and implemented in educational settings. By understanding the relationship between teacher competence, digital tools, and early literacy, this

research will help inform best practices for integrating technology into early childhood education curricula.

METHOD

This study employs a quantitative research methodology with a survey approach. Data were collected using a structured questionnaire distributed via Google Forms to principals, kindergarten teachers, and field observers. The research was conducted at the Selaras Auladia Foundation, located in North Cikarang. The target population for this study consisted of Grade B students at the Selaras Auladia Foundation, Bekasi Regency.

The research utilized three primary instruments for data collection: a teacher competency assessment, an interactive Wordwall media usage instrument, and a literacy ability evaluation tool. These instruments were designed to capture the necessary data to measure the variables under investigation. The dependent variable in this study is early childhood literacy skills (Y), while the independent variables are teacher competency (X_1) and the use of interactive Wordwall media (X_2).

The primary hypothesis of this research is to examine the influence of teacher competency and the utilization of interactive Wordwall media on the development of early childhood literacy skills. To analyze the data, the research employed SPSS 25 software. The initial phase of the data analysis involved descriptive statistics to provide an overview of the collected data. Subsequently, a prerequisite test was conducted to assess the normality of the data, which is essential for ensuring the validity of further statistical testing. The data analysis techniques used in this study include both descriptive and inferential statistics, aimed at evaluating the relationships between the independent variables and the dependent variable, as well as the effects of the interventions on early childhood literacy skills.

RESULTS AND DISCUSSION

This section presents the results of the data analysis, including descriptive statistics, prerequisite tests, and hypothesis testing related to the variables of teacher competency, the use of interactive Wordwall media, and early childhood literacy skills.

1. Descriptive Statistics

The sample in this study consisted of 50 respondents. The descriptive statistics for each of the research variables are presented in Table 1.

Table 1. Description of Variable Score Data

Statistics	Teacher Competency (X1)	Wordwall Media (X2)	Literacy Ability (Y)
N	50	50	50
Valid	50	50	50
Missing	0	0	0
Mean	42.6000	42.4200	42.3600
Std. Error of Mean	0.89123	0.84035	0.82500
Median	42.5000	41.0000	40.5000
Mode	50.00	50.00	40.00
Std. Deviation	6.30193	5.94220	5.83361
Variance	39.714	35.310	34.031
Range	29.00	30.00	30.00
Minimum	21.00	20.00	20.00
Maximum	50.00	50.00	50.00
Sum	2130.00	2121.00	2118.00

From Table 1, it can be observed that the average score for teacher competency (X1) is 42.60, with a standard deviation of 6.30, indicating a moderate variability in teacher competency. The average score for the use of Wordwall media (X2) is 42.42, with a

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standard deviation of 5.94, showing similar variability to teacher competency. For early childhood literacy ability (Y), the average score is 42.36, with a standard deviation of 5.83, which indicates a similar level of variability in literacy skills.

2. Prerequisite Testing

Before testing the hypotheses, prerequisite tests for normality and homogeneity were performed.

a. Normality Test

The normality of the data was tested using the One-Sample Kolmogorov-Smirnov Test. The results are presented in Table 2.

Table 2. Prerequisite Test for Data Normality

Variable	Test Statistic	Asymp. Sig. (2-tailed)
Teacher Competency	0.145	0.010
Wordwall Media	0.148	0.008
Literacy Ability	0.165	0.002

From the results of the Kolmogorov-Smirnov Test, it can be concluded that the p-values for all variables (teacher competency, Wordwall media, and literacy ability) are greater than 0.005. Therefore, the null hypothesis (H_0) is accepted, meaning that the data for each variable follows a normal distribution.

b. Homogeneity Test

The homogeneity of variances was tested using Levene's Test. The results are presented in Table 3.

Table 3. Homogeneity Test for Error Variance

Source	Levene Statistic	df1	df2	Sig.
Based on Mean	0.563	2	147	0.571
Based on Median	0.766	2	147	0.467
Based on Trimmed Mean	0.424	2	147	0.655

The p-values for all tests are greater than 0.005, indicating that the null hypothesis (H_0) is accepted. This suggests that the variances of the groups are homogeneous.

3. Hypothesis Testing

a. Multiple Correlation Coefficient Test

The significance of the correlation between teacher competency, Wordwall media usage, and literacy ability was tested using the Multiple Correlation Coefficient. The results are shown in Table 4.

Table 4. Significance Test of the Multiple Correlation Coefficient

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F Change	df1	df2	Sig. F Change
1	0.946	0.895	0.890	1.93300	199.641	2	47	0.000

The results show that the multiple correlation coefficient (R) is 0.946, which indicates a very strong relationship between the independent variables (teacher competency and Wordwall media usage) and the dependent variable (literacy ability). The R^2 value of 0.895 means that 89.5% of the variability in literacy ability can be explained by the combination of teacher competency and Wordwall media usage. The p-value of 0.000 is less than 0.05, indicating that the correlation is statistically significant.

b. Regression Equation Significance Test

The significance of the regression equation was tested using ANOVA, and the results are presented in Table 5.

Table 5. Significance Test of the Regression Equation (ANOVA)

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1491.906	2	745.953	199.641	0.000
Residual	175.614	47	3.736		
Total	1667.520	49			

The F value of 199.64 with a p-value of 0.000 indicates that the regression model is statistically significant, meaning that teacher competency and the use of Wordwall media have a significant linear effect on early childhood literacy skills.

Discussion

Based on the results of the research that has been conducted above, it can be said that teacher competence has a positive effect on the literacy skills of early childhood. The results of the study are in line with research conducted by Rista Erika, Yoana Nurul A and Najma Adhia, 2024, that teacher competence is a determining factor in the success of early childhood. The results of the study are also supported by the Teacher and Lecturer Law and PP No. 19 of 2005 stating that the competencies that a teacher must have are pedagogical competence, professional competence, personality competence and social competence. Based on the results of the study that has been conducted above, it can be said that interactive wordwall media has a positive effect on the literacy skills of early childhood. The results of this study are in line with research conducted by IAIN MADURA 2024, exploration of interactive wordwall media in developing children's language skills, the results of which showed that there was an increase in the recognition of letters, new vocabulary, simple instructions which are the main indicators in literacy skills. Based on the results of the study, it can be said that teacher competence and wordwall media together become stimulants and have a positive effect on the literacy skills of early childhood. This can be proven based on research that has been conducted by the author, namely.

(1) Teacher competence and wordwall media have a positive effect on early childhood literacy skills. From the data, it was found that the p-value has a value smaller than 0.05. Thus, it can be said that teacher competence and wordwall media have a positive effect on early childhood literacy skills. 2) The significance test of the regression line equation obtained Fhit and p-value <0.05 or Ho is rejected. Thus, the regression of Y or X1 and X2 is significant or teacher competence and wordwall media have a positive effect on early childhood literacy skills. 3) The significance test of the correlation coefficient obtained (rxy) of 0.946, and Fhit (Fchange) of 199.64, with a p-value of 0.000 <0.05. This means that Ho is rejected. Therefore, it can be said that the correlation coefficients X1, X2 and Y are meaningful or significant. While the determination coefficient R Square = 0.895 means 89.5% of the teacher competence and wordwall media variables can be influenced by early childhood literacy skills. Thus, the hypothesis in this study is validly supported by empirical data.

CONCLUSION

Based on the results of the research that has been conducted, it can be concluded that teacher competence and the use of wordwall media have a significant influence on early childhood literacy skills. Regression analysis shows that 89.5% of the variation in children's literacy skills can be explained by teacher competence and the use of interactive wordwall media. Based on this study, empirical data can be said that teacher competence and the use of interactive wordwall media are present together as a stimulant for children to be able to improve literacy skills in early childhood. Therefore, it is expected that educators or teachers can use a variety of interactive media that attract children's interest in learning and also the use of media that is in accordance with the times.

Acknowledgment
Recognize those who helped in the research, especially funding supporters of your research. Include individuals who have assisted you in your study: Advisors, Financial supporters

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