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THE EFFECT OF THE USE OF THE IPUSNAS (DIGITAL LIBRARY) APPLICATION ON STUDENTS' LITERACY ABILITIES AND LEARNING OUTCOMES IN THE ECONOMICS SUBJECT OF GRADE XI OF SMA NEGERI 8 KUPANG

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Abstract

This research is motivated by the low literacy skills and learning outcomes of eleventh-grade students in economics at SMA Negeri 8 Kupang. The purpose of this study was to determine the effect of using the iPusnas application on literacy skills and learning outcomes in economics at SMA Negeri 8 Kupang. The method used in this study was quantitative with a survey approach. The overall study population consisted of 105 eleventh-grade students, from which a sample of 83 students was drawn using proportional random sampling. Data collection was conducted through observation, questionnaire distribution, and documentation. Data analysis was performed using Structural Equation Modeling Partial Least Squares (SEM-PLS) with the assistance of SmartPLS 4 software, which included testing the outer model and inner model. The results showed that using the iPusnas application had a positive and significant impact on literacy skills. Furthermore, literacy skills also have a positive and significant effect on learning outcomes. Furthermore, the use of the iPusnas application also has a positive and significant impact on learning outcomes. Thus, the use of the iPusnas application has been proven to significantly contribute to improving students' literacy skills and learning outcomes in Economics

Keywords: iPusnas Application, Literacy Skills, and Learning Outcomes

INTRODUCTION

Humans are creatures that continue to develop physically, intellectually, emotionally, and socially. One of the main factors supporting this development is education. Education plays a crucial role in improving the quality of human resources through the development of knowledge, skills, values, and attitudes needed in life. Law of the Republic of Indonesia Number 20 of 2003 concerning the National Education System emphasizes that education is a conscious and planned effort to create a learning environment that allows students to develop their potential optimally. Through education, humans will grow and develop as fully integrated individuals, and the progress and decline of a nation's development process in all areas is largely determined by the nation's educational level (Khairinal, 2020) .

Literacy comes from the English word " literacy , " which means "literacy." Over time, the narrow definition of literacy has broadened to encompass various other important fields (Maimunah, 2022) . Furthermore, according to Bu'ulolo (2021), literacy is broadly defined as language skills that encompass listening, speaking, reading, and writing, as well as the thinking skills that are elements within them. This is in line with the opinion of Fayza et al. (2021) who stated that literacy is the ability to read, speak, write, listen, and utilize technology. Good literacy enables students to delve deeper into a material, understand concepts comprehensively, and connect the information obtained to everyday life. Individuals with good literacy will be able to think critically, make the right decisions, and adapt to current developments. In the context of education, literacy is the main key for students to understand subject matter, develop insights, and improve learning outcomes.

Learning outcomes are often used as an indicator to assess the extent to which someone understands and masters the material they have learned. According to Andriani & Rasto (2019) , learning outcomes can reflect the results of the learning process that has been carried out, showing the extent to which students, teachers, the learning process, and educational institutions have achieved the predetermined educational goals. According to Nurita (2022), learning outcomes are an internal ability that has become a personal property of a person and the possibility of that

person doing something according to their abilities. In line with the opinion of Rini & Desyandri (2020), learning outcomes are learning achievements achieved by students during the teaching and learning process that bring about changes in a person's behavior. Achieving high learning outcomes is the hope of various parties, including students, parents, and schools. All parties desire optimal learning outcomes as an indicator of success in the educational process and as provisions for the future of students.

Based on observations and interviews with several teachers conducted by researchers at SMA Negeri 8 Kupang, students' literacy skills are still relatively low. This low literacy ability is also reflected in their difficulties in writing, reading, analyzing, and understanding lesson material. This is thought to be caused by several factors, including low student interest in reading, the inadequate collection of books in the library, and students' reluctance to visit the library. Furthermore, students tend to spend more time playing, chatting with their deskmates, and using their cell phones. The 15 minutes allotted for literacy activities before starting class are also not optimally utilized. To support the results of observations and interviews, the following is a presentation of literacy data and student learning outcomes at SMA Negeri 8 Kupang.

Table 1 Literacy data of students at State Senior High School 8 Kupang

No	Class	Number of Students	Average Literacy Score (Scale 1–75)	Literacy Category
1	XI-1	35	42.8%	Low
2	XI-2	35	45.6%	Low
3	XI-3	35	44.1%	Low
	Total	105	44.2%	Low

Source: SPSS Data Processing Results

Table 2 Mid-Semester Summative Scores (STS) of Grade XI Students in the Economics subject at SMA Negeri 8 Kupang

No	Class	Number of Students	Family Card (KKTP)	Number of Students			
				Achieved	Percentage (%)	Not achieved	Percentage (%)
				Amount		Amount	
1	XI-1	35	75	13	37.14	22	62.85
2	XI-2	35	75	8	22.85	27	77.14
3	XI-3	35	75	9	25.71	26	74.28

Source: Economics teacher, class XI, SMA Negeri 8 Kupang

Based on table 1 above, it can be concluded that the data on students' literacy skills shows that the majority of students are still in the low category. The recapitulation results of the questionnaire given to 105 grade XI students show an average literacy score of 44.2 out of a maximum score of 75. This shows that students' learning literacy is still not optimal, which ultimately has an impact on their low learning outcomes. In addition, based on Table 2 data, it was found that there are still many students who have low learning outcomes or from 105 students spread across the class, it turns out that only 28.57% (30 students) achieved the Learning Objectives Achievement Criteria (KKTP), while 71.42% (75 students) did not achieve the Learning Objectives Achievement Criteria (KKTP).

Efforts to address this issue can be made by increasing the creativity of educational institutions and teachers in utilizing existing technology, one of which is by implementing the iPusnas (digital library) application. Digital libraries are very useful for helping students and teachers in accessing all information in the form of learning materials. This allows students and teachers to easily develop their level of knowledge, such as collecting information, developing analytical skills, and processing all information obtained through access to digital library applications. This is especially helpful for those who have limited access to physical books. In addition, iPusnas also supports digital literacy by getting users used to reading in digital formats, which is in accordance with current technological developments.

The Pusnas application is a digital library application managed by the National Library of the Republic of Indonesia. According to Nugroho et al. , (2022) IPusnas is a digital library that makes it easier for people to access books via gadgets without having to buy books or go to the library. In addition, according to Salsabila et al ., (2022) the iPusnas application is a digital library application where the application has a large collection of books and various interesting features that students can use to improve their literacy skills. By using the iPusnas application, students can read books anywhere and anytime, so they can use their time for useful things. The iPusnas application (digital library) has a positive influence on improving students' literacy skills and revitalizing or reviving digital literacy activities. Students feel more enthusiastic and always set aside time to read books in the iPusnas application (Munthe et al. , 2024) **.** In line with the opinion of Salsabila WA et al ., (2022) who said that the use of the ipusnas application can help improve students' literacy skills, because the iPusnas application, which is a digital library application, has a large collection of books and various interesting features that students can use to improve their literacy skills.

In addition to improving literacy skills, utilizing the ipusnas application can improve student learning outcomes. According to Sanjaya (2023), The use of interactive e-books in learning through the Ipusnas digital library application makes it easier for students to learn independently and in the classroom. Through components such as images, audio, and learning videos, interactive e-books can capture students' attention and increase their learning motivation and academic achievement. Furthermore, research by Thomas Wibowo (2024) There is a positive and significant influence of the use of digital library applications on student learning outcomes.

The novelty of this study lies in testing the effect of the use of the iPusnas digital library application on students' literacy skills and learning outcomes simultaneously in economics. Unlike previous studies that generally only emphasize the use of digital learning media on learning outcomes or focus on improving reading literacy in general, this study integrates the use of digital library applications with two important aspects of learning, namely literacy skills and student learning outcomes. In addition, this study places literacy skills as a variable that plays a role in supporting the improvement of student learning outcomes. This study also provides an empirical contribution in the context of the use of educational technology at the senior high school level, especially for grade XI students at SMA Negeri 8 Kupang, which is still limited in the study of the use of digital libraries as a learning resource in economics.

RESEARCH METHODS

The method used in this study was quantitative with a survey approach. The study population consisted of 105 11th grade students, with a sample of 83 students determined using probability sampling techniques . According to Nurdin et al . (2018), Probability sampling is a sampling technique that provides an equal opportunity for each element of the population to be selected as a sample member.

Data collection was conducted through observation, questionnaire distribution, and documentation. The independent variable used in this study was the utilization of the Ipusnas Application (PAI), while the dependent variables were literacy skills (KL) and learning outcomes (HB). The data analysis technique used Structural Equation Modeling Partial Least Square (SEM-PLS) with the help of SmartPLS 4 software , which includes testing the outer model and inner model .

RESULTS

A. Evaluation of Measurement Model (Outer Model)

According to Suryanto (2022), the outer model or measurement model shows the relationship between the indicator blocks and their latent variables. The measurement model serves as a tool to test construct validity and instrument consistency . Validity and reliability tests examine the quality of the instrument and the appropriateness of the data used in this study. This model illustrates the relationship between the construct and its indicators. This analysis is conducted to determine whether the measuring instrument used is appropriate (valid and reliable) for measurement .

1. Validity Test

a. Convergent Validity Test

The purpose of convergent validity testing is to understand the validity of each relationship between an indicator and its construct or latent variable. According to Ghozali (2014), individual indicators with an outer loading value above 0.7 are considered valid.

Table 3 Outer Model Test

Indicator	Learning outcomes	Literacy Skills	Utilization of the IPUSNAS Application
HB1	0.854		
HB2	0.852		
HB3	0.836		
HB4	0.822		
KL1		0.780	
KL10		0.727	
KL11		0.745	
KL12		0.740	
KL13		0.774	
KL2		0.780	
KL4		0.778	
KL5		0.777	
KL6		0.766	
KL7		0.769	
KL8		0.766	
KL9		0.750	
PAI1			0.830
PAI10			0.845
PAI11			0.764
PAI12			0.845
PAI13			0.764
PAI14			0.809
PAI15			0.851
PAI2			0.846
PAI3			0.831
PAI4			0.801
PAI5			0.842
PAI6			0.844
PAI7			0.794
PAI8			0.835
PAI9			0.845

Figure 1 Outer Model

Based on Table 3 above and the model estimation results in the figure above, all indicators—the learning outcome variable (4 indicators), the ipusnas application utilization variable (15 indicators), and the literacy skills variable (12 indicators)—have outer loading values above 0.70. Therefore, the model meets the convergent validity requirement.

b. AVE (Average Varience Extracted) value

The AVE value aims to measure the level of variation of a construct component collected from its indicators by adjusting the error rate (Chika et al ., 2024) . In the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach, a construct is declared to have good convergent validity if the AVE value is ≥ 0.50. Based on the results of data processing
using SmartPLS 4, the AVE value is obtained as follows:

Table. 4 AVE Values (Average Varience Extracted)

Variables	AVE
Utilization of the IPUSNAS Application	0.674
Literacy Skills	0.582
Learning outcomes	0.708

Source: SmartPLS 4 Data Processing

Based on the analysis results in the table above, the AVE value for all variable constructs is greater than 0.5, which indicates that all indicators in each construct have met the required convergent validity criteria.

c. Discriminant Validity Test

Discriminant validity aims to determine whether a reflective indicator is truly a good measure for its construct based on the principle that each indicator must be highly correlated to its construct only (Furadantin Natalia, 2018) . Discriminant validity arises when two different measuring instruments that measure two constructs are expected to produce scores that have no correlation with each other. testing is carried out using the Fornell-Larcker criterion , namely by comparing the square root value of AVE for each variable with its correlation value against other variables.

Table 5 Results of Discriminant Validity Test

Variables	Learning outcomes	Literacy Skills	Utilization of the IPUSNAS Application
Learning outcomes	0.842	(r HB-KL)	(r HB-PAI)
Literacy Skills	(r KL-HB)	0.763	(r KL-PAI)
Utilization of the IPUSNAS Application	(r PAI-HB)	(r PAI-KL)	0.821

Source: SmartPLS 4 Data Processing

Based on the table, it can be concluded that all variables in this study meet the requirements for discriminant validity. This is because the square root of the AVE for each variable (0.842, 0.763, and 0.821) is greater than the correlation value between the variables in the model.

2. Reliability Test

Used to measure the extent to which the instrument used can be trusted as a tool for collecting data (Gamar et al. , 2024) . In addition, reliability testing aims to ensure that the indicators in each construct have good internal consistency in measuring the same latent variable. In general, a construct is declared reliable if: Cronbach's Alpha ≥ 0.70 Composite Reliability ≥ 0.70. Based on the results of data processing using SmartPLS, the following reliability values were obtained:

Table 6 Reliability Test

Variables	Cronbach's Alpha	Composite Reliability
Utilization of the IPUSNAS Application	0.965	0.966
Literacy Skills	0.935	0.935
Learning outcomes	0.862	0.863

Source: smartPls 4 data processing

Based on the table above, it can be concluded that the reliability test results indicate that all variables in this study meet the reliability criteria. This is evident from the Cronbach's Alpha and Composite Reliability values , which are all ≥ 0.70. This means that each variable has a good level of consistency and stability in measuring the variables studied.

B. Inner Model Evaluation

According to Sari et al ., (2023) this evaluation test aims to analyze the relationship between and assess how well exogenous variables can explain endogenous variables. The relationship between these variables will provide answers to the research objectives, namely hypothesis testing. The structural model in this study describes the relationship between the use of the Ipusnas application, literacy skills and student learning outcomes. Evaluation of the structural model is carried out by analyzing the R Square (R^2) value to see the model's explanatory power, as well as the F Square (f^2) value to determine the magnitude of the contribution of each influence path. In addition, this model also serves as the basis for hypothesis testing through path coefficient analysis .

1. R Square Test

R-square value is used to assess the predictive power of each endogenous latent variable in the structural model. R-square values of 0.75, 0.50, and 0.25 indicate strong, moderate, and weak models, respectively.

Table 7 R Square Test

Endogenous Variables	R Square	R Square Adjusted
Learning outcomes	0.669	0.661
Literacy Skills	0.492	0.486

Source: SmartPLS 4 Data Processing

Based on the table above, it can be concluded that: The use of the IPUSNAS application can explain 49.2% of the variation in students' literacy skills. The use of the IPUSNAS application and literacy skills together can explain 66.9% of the variation in students' learning outcomes. The research model has moderate to strong explanatory power.

2. F Square Test

The F Square value is used to measure the magnitude of the effect of each exogenous variable on the endogenous variable individually. Commonly used criteria in PLS-SEM, the interpretation of the f^2 value is as follows: 0.02 (small effect), 0.15 (medium effect), 0.35 (large effect).

Table 8 F Square Test

Relationship between variables	f^2	Effect Category
Utilization of the IPUSNAS Application → Literacy Skills	0.970	Big
Literacy Skills → Learning Outcomes	0.397	Big
Utilization of IPUSNAS → Learning Outcomes	0.217	Currently

F Square (f^2) analysis , it can be concluded that all paths in the model have a relevant contribution to the endogenous variable, with two paths in the large effect category and one path in the medium effect category.

3. Hypothesis Testing

Hypothesis testing in this study was conducted using the Partial Least Squares – Structural Equation Modeling (PLS-SEM) approach with the Bootstrapping procedure in the SmartPLS 4 application. Bootstrapping was conducted to test the significance of the influence between constructs through the estimation of the path coefficient value (Original Sample/O>0), (t-statistic>1.96) , and (p-value>0.5)

Table 8 Hypothesis Testing

Relationship between variables	Original Sample (O)	Sample Mean (M)	Standard Deviation (SDEV)	T Statistics	P Values
Utilization of the IPUSNAS Application for Literacy Skills	0.702	0.708	0.056	12,435	0.000
Literacy Skills on Learning Outcomes	0.509	0.507	0.091	5,569	0.000
Utilization of the IPUSNAS Application on Learning Outcomes	0.376	0.378	0.097	3,886	0.000

Source: SmartPLS 4 Data Processing

Based on the table above, the following results can be obtained

a. **H1: The Effect of Utilizing the Ipusnas Application on Literacy Skills.**

bootstrapping analysis on the structural model, the Path Coefficient (Original Sample/O) value was obtained at 0.702, t-statistics at 12.435 > 1.96, and P-Value at 0.000 < 0.05. The path coefficient value of 0.702 > 0. indicates that the Utilization of the iPusnas Application has a positive and strong influence on students' Literacy Skills, which means that the higher the utilization of the iPusnas application, the higher the literacy skills. Literacy is no longer understood narrowly as the ability to read and write, but includes the ability to think critically, listen, speak, and utilize technology (Bu'ulolo, 2021; Fayza et al ., 2021). The iPusnas application provides various book collections and interactive features that support students' literacy activities (Salsabila et al., 2022). When students are accustomed to reading through digital platforms, they not only enrich their vocabulary but also train their analytical skills and conceptual understanding.

b. **H2: The Influence of Literacy Skills on Student Learning Outcomes.**

The second hypothesis states that literacy skills influence student learning outcomes. Based on the results of the bootstrapping analysis, the Path Coefficient (Original Sample/O) value was 0.509, t-statistics of 5.569>1.96, and P-Value of 0.000<0.05. The path coefficient value of 0.509>0 indicates that literacy skills have a positive influence on student learning outcomes, which means that the higher a student's literacy skills, the higher the learning outcomes obtained. When students have good literacy, they are better able to understand economic concepts, analyze cases, and connect theory with everyday life practices. Literacy also trains focus, concentration, and critical thinking skills which are very necessary in learning economics (Gyta et al ., 2022).

c. **H3: The Effect of Utilizing the Ipusnas Application on Student Learning Outcomes.**

The third hypothesis states that the Utilization of the IPUSNAS Application has an effect on student learning outcomes **.** Based on the results of the bootstrapping analysis, the Path Coefficient (Original Sample/O) value is 0.376>0 **,** t-statistics is 3.886>1.96 **,** and P-Value is 0.000<0.05 **,** indicating that the Utilization of the IPUSNAS Application has a positive influence on student learning outcomes **,** which means that the higher the level of utilization of the IPUSNAS application by students, the higher the learning outcomes obtained. The use of e-books and digital sources allows students to learn flexibly and independently as explained by Sanjaya (2023) that interactive e-books can increase motivation and academic achievement. Easy access to additional materials makes students more prepared to participate in classroom learning. This is in line with the opinion of Hendrayanto et al . (2022) that iPusnas can support learning because it provides many relevant books. Therefore, digital library applications function as effective alternative learning resources that can improve student learning outcomes.

CONCLUSION

The research results prove that the use of the iPusnas application has a positive and significant effect on students' literacy skills. The use of iPusnas can increase reading activity, broaden horizons, and train the ability to understand and analyze information. Thus, the iPusnas application is an effective tool in supporting the strengthening of student literacy. Furthermore, literacy skills have a positive and significant impact on student learning outcomes. Students with better literacy skills tend to achieve higher learning outcomes. Literacy helps students understand economic concepts, interpret information, and develop critical thinking skills that support academic achievement. In addition, the use of the iPusnas application has a positive and significant impact on student learning outcomes. The more optimally students utilize the iPusnas digital library application, the more their learning outcomes will improve. Access to extensive, flexible, and easily accessible digital reading resources helps students understand economics material more deeply. Overall, this study proves that the use of the iPusnas application has a strategic role in improving student literacy and learning outcomes, so that the integration of digital libraries in economics learning is a relevant and effective step in the digital era.

The results of this study indicate that the use of the iPusnas digital library application plays a significant role in improving students' literacy skills and learning outcomes in economics. Therefore, the results of this study can be used as study material for teachers and schools to further optimize the use of iPusnas as a digital literacy-based learning medium. The integration of iPusnas into the learning process, such as through literacy-based assignments, e-book discussions, and economic reading analysis activities, is expected to encourage students' reading habits and deepen their understanding of learning concepts. This study still has several limitations, including the scope of the

study which was only conducted in one school and focused on one subject, so the results cannot be generalized widely. Furthermore, this study only used the variables of iPusnas utilization, literacy skills, and learning outcomes without considering other factors that could also potentially influence student learning outcomes.

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