THE INFLUENCE OF INDEPENDENT ASSIGNMENTS ON STUDENTS' INDIVIDUAL UNDERSTANDING IN THE INTRODUCTION TO INFORMATION TECHNOLOGY

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Abstract

In the rapidly evolving era of information technology, students' comprehension of the Introduction to Information Technology course at Pignatelli Triputra University is becoming increasingly vital. This course, which lays the foundation for understanding technologies such as computers, informatics, information systems, and electronics, demands up-to-date digital resources. However, observations indicate that students often struggle with complex topics such as scheduling in operating systems, the relational model in databases, and computer architecture. For instance, the topic of scheduling involves grasping algorithms like Round Robin and First Come, First Serve. To address these challenges, a self-directed learning initiative was implemented, incorporating independent assignments that yielded satisfactory results. Nevertheless, difficulties persist in the Final Semester Examination due to a lack of consistent practice and engagement with the

semester's course material. This study aims to develop tailored approaches to optimise students' understanding of Introduction to Information Technology. A strategic improvement is required to enhance the effectiveness of self-directed learning, making it more suitable for students.

Keywords
Information Technology; Self-Directed Learning; Course Comprehension; Independent Assignments; Learning Strategies.

Introduction

In the swiftly advancing era of information technology, it is crucial for students to develop a solid understanding of the Introduction to Information Technology course at Pignatelli Triputra University. This course serves as a foundation for comprehending various technological fields, including computers, informatics, information systems, and electronics. Additionally, it is linked to the development of technology and its innovative application in system implementation. As Syafie et al. (2022) suggest, the development of this course requires concrete and up-to-date digital resources to enable students to create technologies that can serve as control systems for future technological advancements. Similarly, Liana and Alpindo (2021) highlight the importance of such resources in fostering innovation. Despite this, observations reveal that students often face difficulties in understanding certain topics within the course. Among these, scheduling in operating systems, the relational model in databases, computer architecture, and digital systems are particularly challenging. For instance, Lesmana (2017) describes scheduling as a fundamental topic that explains how computers manage time processing through the CPU. Students are expected to comprehend algorithms such as Round Robin and First Come First Serve. According to Putra and Purnomo (2021), Round Robin divides quantum time among queued programs executed

by the CPU, while Riyadi Purwanto et al. (2022) explain that First Come First Serve processes programs based on their arrival order. Given the complexity of these topics, self-directed learning has been implemented to enhance students' understanding, especially for subjects like scheduling (Baharuddin et al., 2022). This approach, which involves independent assignments, has produced satisfactory results, as students performed well when engaging with such tasks. However, a noticeable decline in performance has been observed in the Final Semester Examination, suggesting that students may lack sufficient practice and engagement throughout the learning process (Nainggolan & Manalu, 2022). Self-directed learning is a method whereby individuals take the initiative to learn independently. This approach emphasises that optimal learning outcomes are achieved when students regulate their own learning pace, actively engage in specific learning activities, and succeed in their educational process. Based on these observations, it is evident that a specialised approach is required to improve students' comprehension of scheduling and other complex topics. This effort aims to optimise the learning outcomes in the Introduction to Information Technology course at Pignatelli Triputra University. The primary research question is: How effective are independent assignments in enhancing individual students' understanding of the course material?

Method

This study employed a classroom action research (CAR) approach. Classroom action research refers to research conducted by educators to improve the teaching and learning process in the classroom to achieve specific goals (Ahyani et al., 2023).

The method used in this research was quantitative, with a quasi-experimental design. The study population comprised all students of the Software Engineering program from the

2023/2024 cohort enrolled in the Introduction to Information Technology course at Pignatelli Triputra University (Lenaini, 2021). The sample was selected using purposive sampling, consisting of 16 participants.

The instrument used in this research was an objective test designed based on the course material from the Introduction to Information Technology syllabus. This test aimed to measure the individual understanding of students regarding the subject matter. The data collected were analyzed using a t-test to determine the significant influence of independent assignments on students' comprehension.

The research procedure began by informing the students about the purpose of the study and the procedures involved. Subsequently, independent assignments related to the Introduction to Information Technology course material were provided to the sample group. Following the completion of these assignments, an objective test was administered to measure their understanding of the material. The test results were then analyzed using a t-test to assess whether the independent assignments had a significant effect on individual students' comprehension.

This research employed a quantitative and experimental approach to test the hypothesis regarding the influence of independent assignments on students' understanding in the Introduction to Information Technology course at Pignatelli Triputra University.

Result and Discussion

Result

A. General Data

Table 1 Survey Data

Participant	Pre-Test	Post-Test
1	75	80
2	72	81
3	72	84
4	80	88
5	75	95
6	80	91
7	85	98
8	88	95
9	75	81
10	75	83
11	65	76
12	70	92
13	78	90
14	64	76
15	85	97
16	75	89

Table 1 above represents the data collected from the students' learning outcomes concerning self-directed learning, which enables individuals to complete independent assignments outside the campus environment. Columns two and three display the

scaled results, ranging from 1 to 100. The scoring scale is explained in Table 2 (Simanjuntak et al., 2022).

Table 2 Survey Score

Score Range	Category
Very Good	81-100
Good	61-80
Average	41-60
Poor	21-40
Very Poor	1-20

Correlation Test

The correlation test is a statistical technique used to measure the strength and direction of the relationship between two variables. In this study, the correlation coefficient was used to assess the relationship between the pre-test and post-test scores of the students' learning outcomes (Jamaliyah & Wulandari, 2022).

Validity Test

The validity test involves a series of procedures to ensure that the survey instrument yields consistent and reliable results. This process ensures that the collected data, specifically the pre-test and post-test results, are consistent and stable over time (Sartika et al., 2023).

Normality Test

The normality test was conducted to determine whether the research variables follow a normal distribution. This test ensures that the pre-test and post-test data satisfy the statistical assumptions required for further statistical analysis (Nuzulul Mawadah et al., 2022).

Hypothesis Testing (T-Test)

The T-Test was employed to assess whether the pre-test and post-test results in the Introduction to Information Technology course demonstrate a significant improvement in learning outcomes. To compare the means of two unrelated data sets within a single sample, the Independent Sample T-Test was used, as applied in Cooperative Learning Type Make a Match. The differences between the pre-test and post-test scores in the experimental and control groups were analysed as part of this study (Noviyantia & Dewi, 2023).

Discussion

Correlation and Validity Test

Table 1 Correlation and Validity Test Results

		PreTest	PostTest
PreTest	Pearson Correlation	1	,788**
	Sig. (2-tailed)		<,001
	N	16	16
PostTest	Pearson Correlation	,788**	1
	Sig. (2-tailed)	<,001	
	N	16	16

Based on the correlation and validity tests using SPSS v.27, the significance value (Sig. 2-tailed) was 0.001, which is less than 0.05. This indicates a significant relationship between the pre-test and post-test results after the self-directed learning intervention in the form of independent assignments. Additionally, the Pearson

Correlation value of 0.788, which is greater than 0.497, shows that the survey data used is valid.

Reliability Test

Table 2 Reliability Test Result

Cronbach's Alpha	N of Items
,880	2

Based on the SPSS calculation, the Cronbach's Alpha value was 0.880, which is greater than 0.497. This indicates that the survey instrument used in this study is reliable.

Normality Test

Table 3 Normality Test Result

			Unstandardized Residual
N			16
Normal Parameters[a,b]	Mean		,0000000
	Std. Deviation		4,14828393
Most Extreme Differences	Absolute		,136
	Positive		,081
	Negative		-,136
Test Statistic			,136
Asymp. Sig. (2-tailed)[c]			,200[d]
Monte Carlo Sig. (2-tailed)[e]	Sig.		,579
	99% Confidence Interval	Lower Bound	,566
		Upper Bound	,591

The normality test showed an Asymp. Sig. (2-tailed) value of 0.200, which is greater than 0.05. Therefore, it can be concluded that the data used in this study follows a normal distribution.

Hypothesis Testing (T-Test)

Table 4 T-Test Result

		Levene's Test for Equality of Variances				
		F	Sig.	t	df	Sig. (2-tailed)
Angket	Equal variances assumed	,695	,411	-4,595	30	<,001
	Equal variances not assumed			-4,595	29,829	<,001

The hypothesis for this study was formulated as follows:

H0: Self-directed learning through independent assignments does not enhance individual comprehension.

Ha: Self-directed learning through independent assignments enhances individual comprehension.

The T-Test results show a significance value (Sig. 2-tailed) of 0.001, which is less than 0.05. Consequently, H_0 is rejected, and H_a is accepted. This indicates that the implementation of self-directed learning in the Introduction to Information Technology course at Pignatelli Triputra University significantly enhances students' comprehension of difficult course material.

Conclusion

Conclusion

The purpose of this study was to examine the effectiveness of independent assignments as a tool for self-directed learning in enhancing individual comprehension. The results of the correlation test revealed a positive relationship between the provision of independent assignments and improvements in individual understanding, as evidenced by the correlation between pre-test and post-test data.

The survey instrument used in this research was validated and found to be both valid and reliable. The validity and reliability tests confirmed that the data employed in this study were accurate and consistent. The normality test indicated that the research data followed a normal distribution, which is a critical assumption for several statistical methods, including the t-test.

The t-test results demonstrated that independent assignments significantly improved individual comprehension. The rejection of H_0 (indicating no effect of independent assignments on individual comprehension) and the acceptance of H_a (indicating a positive effect) affirmed the impact of self-directed learning.

In summary, the implementation of independent assignments for self-directed learning is an effective method to enhance individual comprehension. It also presents a promising alternative for improving student learning outcomes.

Suggestion

This study focused on self-directed learning and demonstrated its effectiveness in improving individual comprehension. Considering the rapid advancements in technology and the growing trend of online learning, future research could explore the

efficacy of independent assignments in online or blended learning contexts.

Further studies could compare the effectiveness of independent assignments across face-to-face, online, and blended learning environments. This would provide deeper insights into how independent assignments can be optimised to function effectively in diverse educational settings.

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