



Research on classroom actions to increase learning hours to improve learning outcomes in software as a service subject

Prawidana Kurniawan¹, Hakkun Elmunsyah¹, Aktia Arigiana Umami²

¹ Universitas Negeri Malang, Semarang Street No. 5, Malang, Indonesia.

² SMKN 6 Malang, Ki Ageng Gribig Street No. 28 Madyopuro, 65139, Malang, Indonesia.

Correspondence should be addressed to Prawidana Kurniawan; k.prawidana@gmail.com

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Abstract

The addition of study hours is based on the issue that students do not have the tools for independent study, such as laptops. This lack of resources prevents them from practicing programming independently at home, which can lead to a decreased interest in the learning process in the Software as a Service (SaaS) subject. This issue also impacts the achievement of learning objectives. The problems were identified through non-diagnostic and diagnostic assessments related to prior knowledge, conducted via questionnaires. The goal of adding study hours outside of school time is to provide a more effective learning process, directly impacting the faster achievement of learning objectives as per the targets set. The benefits of the additional study hours include students gaining access to computer lab facilities, allowing them to work on projects independently. The extended study hours also provide students with opportunities to ask questions about programming errors or difficulties they encounter in the learning process, particularly in the SaaS subject. The methods used include questionnaires and classroom observations in class XI SIJA I at SMK6 Malang. The selected population consisted of 36 students. The results indicated that the addition of study hours impacted the faster completion of learning objectives. Before the implementation, two learning objectives were completed in three weeks, but with the addition of study hours, 13 learning objectives were completed within 3 weeks.

Keywords: additional study hours; independent study; learning resources; Software as a Service.

Introduction

Education in 2024 implements an independent learning curriculum, which adjusts to the needs and interests of students, with education that favors students, many learning models can support the learning process that makes students the main subject in the learning process. The implementation of the independent curriculum positions educators as facilitators in the learning process, thus encouraging students to be able to seek information and build their knowledge independently (Prayogo, 2015). The goal is to be able to solve various problems in daily life by

being independent. The independent curriculum encourages the implementation of education that adjusts to the characteristics of the nation by implementing the Pancasila profile, aiming to be able to instill ethical values that can be taken from the six dimensions of faith, diversity, independence, cooperation, critical reasoning, and creativity (Syafi'i, 2021).

The implementation of the independent curriculum by focusing that students as the main subject in the learning process experiences obstacles in its implementation, so that the background of classroom action research is caused by the lack of interest of students in the learning process of software as a service subjects, the factor that causes the lack of interest in learning students because they do not have learning tools in the form of laptops to be able to learn and practice independent related programming. Various other factors that hinder the learning process and various obstacles can be seen from the series of diagnostic and non-diagnostic assessments carried out. The initial series of assessments serves to see students' problems so that learning can adjust to the needs and characteristics of students (Rahmadayanti & Hartoyo, 2022). Various inhibiting factors that can be seen from the diagnostic assessment of students' initial knowledge, and non-diagnostic assessments related to students' backgrounds such as learning styles, personality characteristics of students, problems experienced by students, are able to determine methods, models, media, and learning aids that are suitable for students.

The problem can be seen from the initial knowledge diagnostic assessment, that the average score of students is 26 and those who are willing to do the knowledge diagnostic task are only 14 students out of 36, the number who can complete the assessment is less than half of the class, so it can be said that the sense of responsibility, and the sense of interest in learning in students' needs to be improved in the learning process, Other factors that cause students to be less interested in learning Software as a Service can be seen in non-diagnostic assessments, where 69% of students in class do not like programming, the independent learning factor at home of 59% who only take 30 minutes of independent study, and another factor 25% of the number of students in the class do not have laptops.

A series of assessments can provide educators with consideration to be able to change, or change learning methods and models that can adapt to students, from the above problems teachers provide solutions to be able to provide additional learning hours outside school hours, which aims to help students' problems from the factor of lack of independent learning hours, and the provision of computer facilities for students who do not have laptops.

Learning has many supporting factors to make the learning process more effective, one of the factors that can support and have a great influence on the learning process is learning time, because learning time has an influence on learning achievement (Azis & Ali, 2019). The addition of additional hours of study aims to be able to delve into the material better and can improve memory in subjects whose ultimate goal can be to improve learning achievement (Suyono, Haryadi, & Eko, 2015).

Previous research showed that the addition of learning hours can help students in improving learning achievement because it can be seen from the previous students' grades that the average score was 34, and after special treatment was carried out by providing additional learning hours for students, it was found that the students' scores increased by showing that the average score

was 44, which was concluded that the increase in grades was at a percentage of 29% (Wahyuni, 2022). Another research was carried out at SDN Tambakrejo 10 where students were given additional hours of study for 85 minutes, it is required outside school hours. Students in their previous understanding of mathematics had a score of 75 and after the implementation of the naming of learning hours, the mathematics score in students increased by 84, which can be concluded that the addition of learning hours can help students in improving learning outcomes (Prayogo, 2015). Another research carried out at SMK Negeri 3 Purwokerto using linear regression resulted in the conclusion that the naming of lesson hours has a positive effect on the increase in national exam assessments, especially in mathematics, Indonesian, and English subjects (Suyono et al., 2015). Another study on Mts Negeri 11 Jombang concluded that the increase in lesson hours did not have a significant impact on learning motivation, which applied a simple linear regression method (Mukhlisin, 2019). Learning interests and learning hours can affect learning achievement in XI IPS 3 students at SMA Negeri Kesamben Jombang (Darajaad & Fitrayati, 2016). According to the results of community service related to the addition of lesson hours to foster interest in reading and numeracy literacy, it can increase students' motivation and interest in the culture of reading (Fajaria, Santi, & Rossanty, 2023).

Education is greatly influenced by internal and external factors, where external factors can be interpreted as learning time at school, and internal factors are factors that are guilty from within such as psychic, interest in learning (Darajaad & Fitrayati, 2016). Interest is a transformation of energy in an individual that produces certain feelings in response to a specific goal. Learning without interest will make it difficult to achieve maximum success. Learning does not only occur at school but is also carried out outside of school hours. The use of time outside of school to deepen understanding of the material learned at school can improve learning achievement. Support for active learning outside of school can improve the knowledge and quality of students.

Various problems in the learning process that occur are proposed as a solution which provides additional learning hours for students, to be able to see learning problems, social interactions, and social situations that occur in students and to help students in resolving feelings in terms of programming so that the learning goals can be achieved in line with the set targets (Angraini, Lubis, & Lisdayanti, 2023).

Method

This study uses the questionnaire and observation method in class XI of the Application Network Information System (SIJA) I at SMK 6 Malang. The questionnaire method is applied to non-diagnostic tests to see the characteristics of students, starting from the character of the student's learning method, and the personality character of the student, the non-diagnostic test not only looks at the character of the student but also looks from the point of view of the problems experienced by the student in solving learning outcomes in creating a website project for class leader selection in Software as a Service Subjects. Supporting factors in project completion are included in non-diagnostic tests such as usable facilities.

The researcher also looked at diagnostic tests related to students' knowledge by providing essay questions that could be used as a reference to consider the extent of students' achievements in understanding software as a service subject. A series of diagnostic and non-diagnostic tests can be used as a basis to find out students' problems in completing learning outcomes in software as

a service subject. The observation method was carried out to be able to directly observe the characteristics of students in the classroom and observe the level of students' understanding of software as a service subject. The last step is to evaluate the results of additional learning hours on the achievement of learning goals.

The research was carried out at Vocational High School 6 Malang city, the research was carried out in class XI Application Network Information System (SIJA) I, about software as a service. The research took place from February 12, 2024, to April 18, 2024. The research schedule can be seen in Table 1.

Table 1. Research schedule

No	Date	Cycle	Activities
1.	February 12, 2024 – 15 February 2024	1	Planning and preparation of diagnostic and non-diagnostic test frameworks
2.	February 19, 2024	1	Application of non-diagnostic tests and knowledge diagnostics.
3.	March 22, 2024	1	Evaluation of non-diagnostic tests and knowledge diagnostics.
4.	February 16, 2024	2	Observation planning to see the characteristics of students in completing achievements. Learning.
5.	February 19, 2024- March 4, 2024	2	The implementation of observations related to learning characteristics and students' ability to complete.
6.	March 8, 2024	2	Reflection and evaluation of observation findings in the classroom environment.
7.	March 25, 2024	3	Planning for additional lesson hours.
8.	March 27-28, 2024, and April 5, 2024	3	Implementation of additional learning hours.
9.	April 18, 2024	3	Evaluate the results of the addition of learning hours.

The research is divided into three cycles, the first cycle of tests, the second cycle of observation, and the third cycle of the application of additional learning. Each cycle has stages of planning, implementation, and reflection or evaluation.

The first cycle was held on February 12, 2024 – February 19, 2024, to see the characteristics of students from learning methods, student backgrounds, student problems in software as a service subjects and to see supporting factors in determining the success of students in completing learning achievements, the level of understanding of students in understanding the material presented. These things can be known from a series of non-diagnostic assessment tests and knowledge diagnostic assessments. The second cycle was held on February 16, 2024 – March 8, 2024, where observation was carried out every Monday in class XI of the Application Network Information System (SIJA) I, observations were made to observe the characteristics of students directly in class, to see how students learn, observing the difficulties and problems experienced by students in completing learning difficulties in the Software as a Service subject, where the final learning achievement of students is to create a website project for the selection of class leaders.

The third cycle will be held on March 25, 2024 – April 18, 2024, the third cycle focuses on the implementation of additional learning hours outside of class hours. The third cycle begins with the planning of additional lesson hours because it is considered that students need special treatment to be able to complete the final project, then the implementation of lesson hours is given outside school hours, evaluation is carried out to see a comparison after the implementation of additional learning hours.

The object of the research is students of SMKN 6 Malang, especially in class XI of the Application Network Information System (SIJA) I. The number of students is 36 people. Data collection uses a questionnaire using a google form that can be filled out by students of class XI Application Network Information System (SIJA) I, questionnaires related to non-diagnostic assessments to see students' backgrounds, and questionnaires in the form of knowledge assessments on students. Data collection was carried out on February 19, 2024, the questionnaire was filled out at the beginning of the software as service lesson hours.

Results and Discussion

Classroom action research in adding lesson hours outside school hours is based on non-diagnostic assessment actions and knowledge diagnostics. Non-diagnostic assessment leads to an assessment of students' backgrounds related to the characteristics of students' learning styles, students' personality traits, problems in understanding the material, and factors that hinder understanding the material. Knowledge diagnostic analysis looks at the achievement of students in software as a service subject. A table of non-diagnostic assessment results for students in Class XI of Network Information System I is presented in Table 2.

Table 2. Non-Diagnostic Assessment

No.	Category	Valuation	Result
Background			
1	Learning Style	Visual kinesthetics	28%
2	Age Range	18 years old	69%
3	Gender	Male	53%
4	Religion	Islam	100%
5	Ethnicity	Javanese	78%
6	Personality	stable	63%
7	Personality Traits	introvert	59%
Problems			
1	Interest in Coding	Dislike	69%
2	Programming Language Mastery	PHP	89%
3	Independent Study Scheduling	Not scheduling independent study	78%
4	Study Duration	30 minutes	59%
5	Laptop Ownership	Owens one	75%
6	Tutoring Participation	Not attend	97%
7	Learning Media	YouTube	69%
8	Number of Awards	1 award	34%
9	Pocket Money	IDR 10,000	50%

The above non-diagnostic research is divided into categories of students' backgrounds and problem categories, it can be seen in the table above that students in class XI of Application Network Information System I, students' backgrounds are dominated by Islam, with Javanese ethnicity, students are more male, students' characteristics are dominated by introverts, and stable personalities.

The problems experienced by students in non-diagnostic assessments, who do not like the teaching of 69%, other factors are 78% do not set a study schedule at home, and 59% of students only study for 30 minutes at home, and other factors of the problem.

Diagnostic assessment looks at the initial ability of students to understand the extent of understanding knowledge related to software as a service subjects, it can be seen in the drawing above that the level of responsibility of students is low, because students who can complete and collect only 14 people out of 36 people, with an average score of 26. The figure above shows related to the use of bloom's taxonomy that it can be concluded that the ability to apply and analyze problems is still relatively low.

A series of diagnostic assessments and non-diagnostic assessments can measure related factors that cause problems in students in the learning process. This series can provide consideration for teachers to be able to provide solutions with additional learning hours. The additional factors are based on a series of diagnostic assessments and non-diagnostic assessments. The addition is not only based on the previous series of assessments but also based on the observation of learning outcomes in students on database materials and database display materials.

DATABASE MATERIAL

35
30
25
20
15
10
5
0

succeed

unfinished

In Meeting I, for the database topic, 33 students completed the database module with a completion rate of 91.67% in a single session on February 21, 2024. However, 3 students did not complete the module, with a non-completion rate of 8.33%, due to limited access to laptops at home as a learning tool and a lack of engagement in the learning process.

In Meetings II and III, covering the data presentation topic, the student success rate was 52.78%, with 19 students completing the assignment, while 17 others had not yet completed it, resulting in a non-completion rate of 47.22%. The task was completed over three weeks, from February 19, 2024, to March 4, 2024, with three sessions.

The observations and analysis revealed several challenges faced by students. The module's unstructured format caused confusion, making it difficult for students to adapt to the content. Additionally, some students require special attention while completing assignments. A lack of sufficient computers in the classroom further hindered the learning process, and many students did not have laptops to support their studies at home. These challenges led to the addition of study hours, with the results presented in Table 3.

Table 3. Comparison of the Process of Adding Lesson Hours

Before the addition of class hours		After the addition of class hours	
Achievement materials	Time	Achievement materials	Time
2 achievements	4 x meetings	13 achievements	3x formal meetings + 3x meetings outside of school hours

The two learning topics, database and displaying database, were covered in four sessions, consisting of three formal sessions and three additional sessions outside school hours, successfully achieving 13 learning objectives.

However, there were challenges in implementing the additional study hours. Many students lacked responsibility in following the schedule and attending sessions outside school hours. They perceived the increased study load as overwhelming, and only a few showed interests in extending their learning time.

Conclusions

The implementation of additional learning hours has had a positive impact on the completion rate of learning objectives. It is evident that the extended study time has enhanced students' understanding, allowing them to grasp concepts more quickly. The additional hours also helped address students' difficulties in working on the website project for class leader selection in the Software as a Service (SaaS) subject. Before implementing additional study hours, only two learning objectives were completed within four weeks. However, after introducing extra study hours, 13 learning objectives were successfully completed within just three weeks. Despite these benefits, the initiative faced several challenges. Many students were unwilling to extend their study hours after school, as they felt that the additional sessions added to their already demanding schedules. Furthermore, a lack of responsibility and motivation for self-improvement was evident in students' attitudes and behavior. As a result, while the additional learning hours benefited some students, they did not have a significant impact on the learning outcomes of all students.

Data Availability

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

Conflicts of Interest

All authors in this publication declare no conflict of interest regarding the title, data, location, and results of the research.

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Supplementary Materials

This study does not include any supplementary materials.

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