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THE RELATIONSHIP BETWEEN COMPUTER LABORATORY FACILITIES AND INTERNET NETWORKS ON STUDENT LEARNING OUTCOMES AT UNIVERSITY OF BHINNEKA PGRI

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***Abstract*——** **This study aims to determine the relationship between computer laboratory facilities and internet networks on student learning outcomes in the Information Technology Education Study Program at University of Bhinneka PGRI. The background of this research is based on the importance of supporting facilities and infrastructure, especially computer laboratories and internet network access, in supporting the learning of practice-based courses such as programming. Computer laboratories provide space for students to apply theory into practice, while the internet serves as a source of information as well as a communication and collaboration tool. However, the effectiveness of these two facilities in improving learning outcomes still needs to be studied empirically. This study used a quantitative method with a descriptive correlational approach. The study population was 2 and 4 semester students, with a total sample of 32 students. Data collection instruments were a questionnaire with a Likert scale and documentation of programming course grades. Data were analyzed through validity, reliability, normality, linearity, multicollinearity, and hypothesis testing using correlation analysis and simple and multiple linear regression. The results showed that there was no significant relationship between computer laboratory facilities and student learning outcomes (p = 0.376), and there was no significant relationship between the internet network and student learning outcomes (p = 0.781). Multiple linear regression tests also show that simultaneously, the two independent variables do not have a significant influence on learning outcomes (p = 0.312). This finding is reinforced by several previous studies which state that the existence of facilities alone does not guarantee an increase in learning outcomes if not accompanied by optimal utilization and the right learning approach.**

Keywords-- Computer Laboratory Facilities, Internet Network, Learning Outcomes.

I. INTRODUCTION

Education is an important aspect to shape human personality. The provision of complete facilities participates in ensuring the progress of an activity in the aspect of education in the computer field, one of the facilities that are needed is a computer laboratory. Computer laboratories are facilities and places to support processes related to measurement, development of understanding, development of skills and innovation in the world of education [1]. Access to computer laboratories equipped with the latest hardware and software, as well as fast and stable internet network infrastructure, is needed. With the internet, everything is made easy. In addition, a wide variety of information can be found on the internet in all areas where the internet is essential, such as in learning, work, and business[2]. The internet is needed by students to access online materials, tutorials, discussion forums, and programming tools.

Student learning outcomes are achievements that students achieve academically through exams and assignments, actively asking and answering questions that support the acquisition of these learning outcomes. In academic circles, it is often thought that the success of education is not determined by the student's grades listed on the report card or on the diploma, but for the measure of success in the cognitive field can be known through the learning outcomes of a student[3]. However, often the limitations of computer laboratory facilities and internet networks are the main obstacles in achieving optimal learning outcomes. Several studies have shown that adequate laboratory infrastructure significantly contributes to improving student academic results in programming. In addition, poor internet access can hinder students from utilizing available digital resources for programming learning, which has a direct impact on their learning outcomes.

With this background, this study aims to identify the relationship between computer laboratory facilities and internet networks on student learning outcomes in programming courses at University of Bhinneka PGRI. The results of this study are expected to be an evaluation material for study program managers and universities in an effort to improve the quality of supporting facilities and infrastructure, and improve student learning outcomes.

II. LITERATURE REVIEW

A. Computer Laboratory Facilities

The laboratory room is a practical learning place that requires special equipment in the form of supporting equipment and a set of computers. The arrangement of computer devices needs to be designed so that the learning and teaching process can take place optimally[4].

1. Indicators of laboratory facilities

Determination of computer laboratory standards refers to the analysis described in the attachment to Permen No. 40 of 2008 concerning Higher Education Infrastructure Standards. The explanation is as follows:

a. Computer laboratory room

b. The computer laboratory room can accommodate a minimum of half the study group.

c. The minimum ratio of computer laboratory space is 3 m^2 /learner. The minimum area of the laboratory is 64 m^2 including storage and repair space of 16 m^2. The minimum width of the computer laboratory room is 8 m.

d. Completeness of computer lab furniture (tables, chairs for students and lecturers).

e. Completeness of equipment and educational media in the computer lab (computers, printers, scanners, stabilizers, LAN, practice modules, and whiteboards)[5].

B. Internet Network

The internet comes from the word interconnected network which is summarized as an international network that can connect smartphones and computers to each other, all over the world. Internet access through smartphones and equipped with internet network sites that provide benefits and convenience for users to access and obtain information from various media, especially from electronic media.[6].

1. Benefits of Internet Network

The benefits that can be obtained from using the internet in the teaching and learning process are [7].

- Ability and speed in communication
- The availability of up to date information has encouraged the growth of motivation to read
- Through educational websites, the learning process can be done dynamically, not depending on the time and space of the meeting. All learning materials can be obtained easily on available educational websites.
- Through e-mail, the scalability of consultation can be not limited to educators or colleagues within the school environment, but can be used to consult with people who are considered competent in their fields outside the educational institution, even those abroad.
- The availability of e-moderating facilities where teachers and students can communicate easily through internet facilities on a regular basis or whenever communication activities are carried out without being limited by distance, place and time such as Facebook, Twitter, etc.
- Teachers and students can use teaching materials or learning instructions that are structured and scheduled via the internet, so that both can assess each other to what extent the teaching materials are learned.
- If students need additional information related to the material they are learning, students can access the internet more easily.

2. Impact of the Internet Network

The positive effects of the internet network are [7] :

- Students are actively learning.
- Students are more familiar with internet knowledge and technology.
- Students' learning abilities can develop more rapidly.
- The knowledge and knowledge gained by students is unlimited.
- Train students' communication and discussion skills on the side.
- Train motor skills in terms of using and benefiting from technology.
- Easy to do, both for students and for teachers.

While the negative impact:

- Fixated and highly dependent on advances in information technology.
- Opportunities for students to access or download from sites that are not good enough, such as porn sites, anarchists, criminals, and other sexual violence.
- Tends to weaken students in terms of fostering motivation to learn, especially those that contain motor elements such as writing, counting, or exercising.
- Train students to become plagiarists and copyright pirates. The reason is clear because it only contains elements of copy and paste (cheating / copying).
- Less effective for subjects that involve physical activities and activities such as skills and sports subjects.
- Students often become addicted (want more and more).

C. Learning Outcomes

Learning outcomes are a reflection of the learning efforts made by students. In formal education, measurement and assessment are always followed, as well as in the process of teaching and learning activities by knowing the results of learning, it can be seen the position of students who are good, moderate or less.[8].

1. Learning Outcome Indicators

Learning outcome indicators are used to measure changes that occur in events or activities. They are needed as a reference to assess the extent of the development of one's learning outcomes. The following are indicators of learning outcomes :

a) Intellectual Skills

The performances shown by students about the intellectual operations they can perform are called intellectual skills. Through the use of symbols or ideas, intellectual skills allow a person to interact with their environment.

b) Cognitive Strategies

In this cognitive strategy, students must show complex situations where they do not have much help to choose and apply the rules and ideas they have learned before. Remembering, thinking, and behaving can be regulated by this ability.

c) Attitude

Attitude, which is the action shown in science activities. The affective domain includes behavioral traits such as feelings, interests, attitudes, emotions, and values.

d) Verbal Information

Verbal information and verbal knowledge are stored in propositional networks. In this situation, teachers can ask students questions with the aim of teaching them to answer verbally.

e) Motor Skills

Motor skills include physical activities and intellectual skills. By looking at the speed, accuracy, and fluidity of a person's muscle movements, as well as the limbs considered, we can determine a person's motor skills.

II. RESEARCH METHODOLOGY

This research is of the quantitative correlation type. The use of quantitative methods such as correlation primarily aims to identify the extent to which fluctuations in a particular factor correspond to changes in one or more additional factors, relying on the correlation coefficient. Correlational research investigates differences in the attributes of two or more variables. The relationship between variables occurs within one group [9].

A. Population and Sample

Population refers to the overall object or subject that is the target of research[10]. The population in this study were students in the technology and information education study program at University of Bhineka PGRI in the 2025 academic year.

Table 3. 1 Research Population

No	Class	Number of Students
1	Semester 2	18
2	Semester 4	14
3	Semester 6	34
4	Semester 8	72
Sum		138

Samples are part of the population selected for study. Samples are used as a representation of the population so that research can be done more practically without having to study the entire population[10]. The sample of this study were 2nd semester students totaling 18 students and 4th semester students totaling 14 students in University of Bhineka PGRI information and technology education study program in programming courses in the 2025 academic year.

Table 3. 2 Research Sample

No	Class	Number of Students
1	Semester 2	18
2	Semester 4	14
Sum		32

B. Data Analysis Techniques

Data collection in research is an important step to obtain information that is relevant to the research objectives. This process requires instruments, which are tools used to collect data from respondents. One instrument that is often used is a questionnaire, which is effective for collecting large amounts of data systematically. Data assessment from questionnaires usually uses a Likert scale, which serves to measure the perceptions, attitudes, or opinions of individuals or groups towards a social phenomenon[11].

In the Likert scale, each answer choice is given a score with a value range of 4, 3, 2, to 1. Likert scale with five answer options, namely strongly agree (value 4), agree (value 3), disagree (value 2), and disagree (value 1).

C. Instrument Validity and Reliability

The validity test is carried out to ensure that the instrument used is really able to measure the variables under study. In this study, the validity test was carried out with the help of SPSS software version 25. The number of respondents was 28 students with the number of statements tested as many as 45 statements of variable X_1 and 12 statements of variable X_2. Testing was carried out at a significance level of 5% ($\alpha < 0.05$) as a reference for decision making. The reliability test of the research instrument was used to assess the credibility of the questionnaire used to collect research data. If a variable shows an Alpha Cronbach value> 0.600, then the variable can be said to be consistent or reliable in its measurement.

D. Data Analysis Hypothesis Test

In this study, the classical assumption test includes normality test, multicollinearity test and linearity test. Furthermore, correlation tests and hypothesis tests are carried out through two approaches, namely simple linear regression tests (T tests) and multiple linear regression tests (F tests).

III. RESEARCH RESULTS

A. Presentation of Research Data

This research was conducted to find out "The Relationship between Computer Laboratory Facilities and Internet Networks to Student Learning Outcomes at University of Bhinneka PGRI". Data collection in this study used a questionnaire as a measuring tool, a questionnaire given to students totaling 44 statement items, with 32 students in the technology and information education study program as samples in this study.

In the implementation of this study, several data tests were carried out on the results of the research that had been carried out, in this section showing the results of data on each variable obtained during research at University of Bhinneka PGRI with a research sample of 2 semester students totaling 18 students and 4 semester students totaling 14 students in the technology and information education study program.

The data from this study include the relationship between computer laboratory facilities and internet networks on student learning outcomes obtained from the results of questionnaires via google form.

B. Hypothesis Test Data Analysis

1. Classical Assumption Test

a. Normality Test

The normality test aims to determine whether the suitability or accuracy is normally distributed or not. The normality test will be carried out using the Kolmogrov-Smirnov method with the SPSS version 25.0. Kolmogrov-Smirnov method is said to be normal if the alpha value >0.05 then the data is declared normal, if the alpha value <0.05 then the data distribution is not normal. The results of the normality test that has been carried out can be seen in the following:

Table 4. 1 Normality Test Result

Asymp. Sig. (2-tailed)	Significance	Conclusion
0,200	>0,05	Normal

The results of the normality test using the One-Sample Kolmogorov-Smirnov Test show that the Asymp. Sig. (2-tailed) value is 0.200. Because this value is greater than the significance level of 0.05, it can be concluded that the data is normally distributed.

b. Linearity test

The linearity test is a process to determine whether there is a significantly linear relationship between two variables, the criterion for this test is if the significance value (Sig.) <0.05, then the relationship between the independent variable and the dependent variable is declared significantly linear.

Table 4. 2 linearity Test Result

Variable	Deviation from Linearity
(X_1) to (Y)	0,021
(X_2) to(Y)	0,000

The linearity test results show that the relationship between variable X_1 (Computer Laboratory Facilities) and Y (Learning Outcomes) has a Deviation from Linearity value of 0.021. Because this value is greater than the significance level of 0.05, the relationship between X_1 and Y is declared linear. Conversely, the relationship between variable X_2 (Internet Network) to Y (Learning Outcomes) has a value of 0.000, which means it is smaller than 0.05, so the relationship between X_2 and Y is declared not linear.

c. Multicollinearity Test

Multicollinearity is a condition in regression analysis that occurs when two or more independent variables have a very strong relationship with each other. The multicollinearity test results are declared not to occur multicollinearity if the Tolerance value >0.1 and VIF <10.

Table 4. 3 Multicollinearity Test Result

Variable	Tolerance	VIF
(X_1) to (Y)	O,511	1,955
(X_2) to (Y)	0,511	1,955

Based on the results of the table above, the VIF magnitude of the computer laboratory facility variable (X_1) and the Internet Network (X_2) is 1.955 < 10.00, it can be concluded that there is no multicollinearity.

2. Correlation Analysis

a. Correlation Test

This analysis will produce a correlation coefficient (r) which indicates the strength and direction of the linear relationship, as well as a significance value (p-value) to determine whether the relationship is statistically significant at a significance level <0.05.

Table 4. 4 Correlation Test Result

Variable	Correlation Coefficient (r)	p-value
(X_1) to (Y)	-0,227	0,130
(X_2) to (Y)	-0,227	0,212

Based on the results of the correlation test above, there is a weak and negative relationship between variables X_1 and Y. This means that as X_1 increases, Y tends to decrease, but this relationship is not strong. This relationship is not statistically significant because the p value (0.130) > 0.05. Meanwhile, the correlation test results between variables X_2 and Y. This means that as X_2 increases, Y tends to decrease, but this relationship is not strong. This relationship is not statistically significant because the p value (0.212) > 0.05.

3. Hypothesis Analysis

a. Simple Linear Regression Test (T tests)

The test in simple linear regression aims to determine whether the independent variable partially has a significant effect on the dependent variable. This test is used to find the t test with a reference if the significance value (Sig.) <0.05, then the independent variable is stated to have a significant influence on the dependent variable.

Table 4. 5 Simple Linear Regression Test Result

Variable	Sig
X_1 to Y	0,376
X_2 to Y	0,781

The significance value for X_1 is 0.376, which is greater than 0.05 (p > 0.05). This means that changes in X_1 do not significantly affect changes in Y. So it can be concluded that

the computer laboratory facilities variable (X_1) has no significant relationship with student learning outcomes (Y). H01 is accepted and Ha1 is rejected.

In research conducted by Valentine J et al.[12] found that the results showed that school facilities did not have a significant effect on students' cognitive learning outcomes. This is explained because students' cognitive achievement is more influenced by other factors such as teaching effectiveness, curriculum quality, students' initial abilities, and learning strategies used by teachers. School facilities are important in creating a comfortable and conducive learning environment, but they do not directly improve students' critical thinking, problem solving, or mastery of academic material.

The significance value for X_2 is 0.781, which is greater than 0.05 ($p > 0.05$). This means that changes in X2 do not significantly affect changes in Y. So it can be concluded that the internet network variable (X_2) has no significant relationship with student learning outcomes (Y). H02 is accepted and Ha2 is rejected.

In the journal "The 'Online Brain': How the Internet May Be Changing Our Cognition" oleh Firth et al.,[13] it is explained that excessive internet use can interfere with cognitive functions such as concentration ability and long-term memory. An internet full of distractions such as social media, advertisements, and information overload can lead to a decrease in learning focus and shallow thinking habits. Dependence on the internet to find information instantly can also reduce students' motivation to learn and critical thinking skills. If the use of the internet is not directed positively, then instead of supporting the learning process, it can actually hinder the achievement of optimal learning outcomes.

b. Multiple Linear Regression Test (F Test)

The multiple linear regression test is used to determine the effect of several independent variables on one dependent variable. If the significance value is <0.05, then the effect is significant, while if ≥ 0.05, then it is not significant.

Table 4. 6 Multiple Linear Regression Test Result

Variable	Sig
Computer Laboratory Facilities (X_1) and Internet Network (X_2) to Learning Outcomes (Y)	0,312

The results of the F test in the table above can be concluded that the significance value is 0.312 (F = 1.213) > 0.05, it is concluded that simultaneously, the variable computer laboratory facilities (X_1) and the internet network (X_2) do not have a significant relationship to the learning outcomes variable (Y). H03 is accepted and Ha3 is rejected.

In a study conducted oleh Mao et al.[14] explained that although the internet can support the learning process, if not utilized wisely, it can actually be a serious obstacle to achieving optimal learning outcomes. The journal explains that uncontrolled use of the internet can have a negative impact on learning outcomes. One of the main impacts found is digital distractions, such as opening social media, online games, or watching entertainment content during the learning process. These distractions reduce concentration, shorten attention span and lead to decreased learning effectiveness.

High reliance on the internet can also lead to a decline in critical thinking skills and a tendency to over-multitask, which inhibits a deeper understanding of the material. Some students also have difficulty in distinguishing valid and relevant information from inaccurate information, resulting in less effective learning. This shows that the existence of internet facilities and access needs to be balanced with digital literacy, good time management, and supervision or guidance from lecturers so that its use really supports the learning process. Without these supporting factors, existing technology facilities risk becoming a distraction rather than an effective learning tool[15].

Computer laboratory facilities or virtual learning infrastructure do not directly improve student learning outcomes. Although the facilities exist, learning outcomes will not improve if students do not have adequate computer competence. This shows that facilities will only be effective if users are able to operate them optimally. In other words, learning facilities are not a stand-alone factor, but require the support of students' technical skills so that they can actually be utilized to support success in online learning. So, the existence of facilities alone does not guarantee the achievement of good learning outcomes, because what is more important is the extent to which students are able to use these facilities effectively[16].

IV. CONCLUSION

There is no significant relationship between computer laboratory facilities and student learning outcomes. The statistical test results show that the significance value ($p = 0.376$) > 0.05, which indicates that the existence of computer laboratory facilities has not provided a real relationship to the learning outcomes of University Bhinneka PGRI students. Although the facility exists, its effectiveness is influenced by other factors such as optimal utilization, study room comfort, and effective learning strategies. Previous research also shows that the existence of learning facilities does not guarantee an increase in cognitive learning outcomes, but rather plays a role in supporting students' affective and psychomotor aspects. Therefore, computer laboratory facilities are more supportive than the main determinant of learning success.

There is no significant relationship between the internet network and student learning outcomes. The analysis results show a significance value ($p = 0.781$) > 0.05. This means that the use or availability of the internet network has not been maximally utilized to support student learning outcomes. Although the internet has the potential as a learning support medium, many students do not utilize it optimally for academic activities. Factors such as limited access, low digital literacy, more dominant use of the internet for entertainment, and lack of guidance in internet utilization are the main causes of the internet's powerlessness in improving learning outcomes. In addition, excessive use of the internet can negatively impact students' focus, motivation, and critical thinking skills.

Simultaneously, computer laboratory facilities and internet networks do not have a significant relationship to student learning outcomes. This is evidenced by the

significance value of the multiple regression test of 0.312> 0.05. Thus, these two variables are not the main factors associated with learning outcomes in the context of this study. Although these facilities are important, their existence does not guarantee improved learning outcomes without optimal utilization and adequate digital literacy. Other factors such as learning motivation, teaching methods, learning environment and parental support also have a more dominant influence on learning outcomes. Therefore, strategic steps are needed to improve student learning outcomes, including improving digital literacy, time management, and the active role of lecturers as facilitators. In addition, improving laboratory facilities and infrastructure and increasing internet network capacity are also important to support a more effective learning process. With integrated efforts, it is expected that student learning outcomes can improve significantly and sustainably.

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