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THE INFLUENCE OF INTERNET USAGE AND STUDENT LEARNING CREATIVITY ON LEARNING OUTCOMES IN INFORMATICS AT VOCATIONAL HIGH SCHOOL 2 TULUNGAGUNG

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***Abstract*— In the current era of globalization, the use of the internet and student learning creativity is very helpful in the learning process in improving student learning outcomes. This research was conducted at SMKN 2 Tulungagung using Quantitative research methods with a sample of 74 class X students taken randomly. Data was obtained using a questionnaire. From the results of the data that has been obtained, it will be analyzed using the Simple and Multiple Linear Regression method. Data analysis includes: 1) Normality Test, 2) Homogeneity Test, 3) Multicollinearity Test, 4) Heteroscedasticity Test, 5) Linearity Test. Hypothesis testing partially (T test), and simultaneously (F test). The results of the hypothesis show that partially there is an effect of internet usage on learning outcomes of informatics subjects at SMKN 2 Tulungagung with a significance value of 0.014 smaller than 0.05 and partially there is no effect of student learning creativity on learning outcomes of informatics subjects at SMKN 2 Tulungagung with a significance value of 0.374 greater than 0.05. The hypothesis results also show that simultaneously there is an influence of internet usage and student learning creativity on learning outcomes in informatics lessons at SMKN 2 Tulungagung with a significant value of 0.005 smaller than 0.05.**

Keywords*— *Internet Use, Student Learning Creativity and Learning Outcomes

I. INTRODUCTION

The rapid development of information and communication technology allows students to easily access various information via the internet. This opens up opportunities for them to expand their knowledge independently and improve their learning outcomes. The use of the internet in the learning process can provide significant benefits if used wisely to access educational materials or resources at school. However, in reality, many students still use the internet not for educational purposes but for playing online games, using social media, and chatting [1].

The internet is expected to serve as a learning resource and facilitate students in obtaining various information that supports learning. However, many students still misuse the internet, as its use is often outside the scope of learning. The internet is expected to function as a supportive tool that facilitates students in accessing learning materials [2].

One of the key components of the learning process is creativity. Creative learning can train students to become less dependent on others. The level of students' creativity in the learning process plays an important role in their learning success. Students with high levels of creativity tend to have a broader understanding of the material being studied, thereby positively contributing to the improvement of learning quality [3].

Learning outcomes are a way to measure how well students understand the material within a certain period of time. Teachers must assess students' ability to understand the material through their evaluation scores. [4]. Student learning outcomes are academic achievements obtained through exams and assignments, as well as active participation in asking and answering questions that support learning outcomes, which determine students' mastery of the subject matter [5]. Students who show high enthusiasm in participating in the learning process tend to achieve optimal learning outcomes. Maximum learning outcomes indicate high mastery of the subject matter by students.

This study aims to examine the variables of internet use, student learning creativity, and student learning outcomes. It is hoped that the results of this study can be used as a reference for schools to determine the extent of students' ability to use the internet and think creatively to support maximum learning outcomes.

II. LITERATURE REVIEW

A. Internet usage

Internet usage refers to the activities of individuals or groups in accessing, searching for, and sharing information through the internet network. This usage includes various services such as information search, social media, e-commerce, and digital communication [6].

In addition, research by Sriyono [7] reveals that effective internet usage can increase productivity and efficiency in various fields. However, they also highlight the importance of digital literacy so that users can make optimal use of the internet without getting caught up in negative impacts, such as digital addiction and the spread of invalid information.

Thus, internet usage can be defined as the use of network technology for various purposes, ranging from communication to education. Therefore, it is important for everyone to have a sufficient understanding of how to use the internet wisely in order to maximize its benefits in daily life.

The role of the internet in the learning process includes according to Ari Supomo [8]:

1) Abundant sources of information

The internet provides access to unlimited information from various fields of science, news, research, and other general knowledge.

2) Additional learning resources

The internet provides numerous additional learning materials such as e-books, educational videos, tutorials, and online learning platforms. Students can freely utilize these resources to better understand specific topics that may be unclear during classroom instruction.

3) The internet as an online library

The internet functions as an online library, enabling students to access books, scientific journals, articles, and other documents anytime and anywhere.

4) The Internet provides multimedia tools

Through the Internet, students can use multimedia tools such as videos, animations, simulations, and educational games, making learning more interactive and engaging.

5) Making the learning system enjoyable

With the availability of game-based learning platforms, interactive educational videos, and discussion forums, the use of the Internet in education can create a more interactive and enjoyable learning environment.

6) Facilitates students' understanding of lesson materials

The internet offers various methods of presenting materials, such as visual, audio, or direct simulations, which can make it easier for students to understand complex lesson materials, making them easier to learn.

7) Encourages independence

The internet allows students to learn independently through information searches, problem-solving, and accessing materials without heavily relying on teachers or textbooks, thereby enhancing their ability to learn independently.

8) Facilitating communication

The internet provides communication tools such as email, discussion forums, and chat applications. Students can communicate with peers, teachers, or experts in specific fields to discuss lessons without geographical limitations.

Indicators of internet usage [9] :

1) Intensity: How frequently students use the internet for information, entertainment, learning, and other purposes.
2) Benefit: Internet use simplifies tasks, enhances skills, provides benefits for learning outcomes, and boosts student productivity.
3) Effectiveness: Internet use improves task effectiveness, understanding of materials, and individual performance in completing tasks.
4) Purpose of use [10], student activities when using the internet include searching for materials, communication, entertainment, and digital transactions.
5) Skills in using the internet for learning: Students need to have the ability to search for valid information, use educational applications, and filter credible information.
6) Barriers to using the internet for learning: Barriers to using the internet include limited access, distractions from non-learning content, and difficulty understanding online material.

B. Kreativitas Belajar Siswa

Creativity is one of the important skills that students need to have in order to achieve academic success. Creativity is not always defined as the ability to create something completely new, but rather reflects intelligence in understanding certain situations or conditions, which still require further guidance and understanding. In theoretical studies, creativity is known through the concept of the four P's of creativity, namely person, process, press, and product. Creativity from the 'person' aspect refers to the creative potential possessed by each individual. Meanwhile, creativity as a 'process' is defined as a pattern of thinking that encourages a person to build new connections, find solutions, or seek innovative approaches to solving a problem. Creativity as a "driver" (press) that comes from within oneself in the form of strong creative motivation and desire. Creativity from the "product" aspect refers to all forms of an individual's creations that emerge as a manifestation of personal uniqueness in interacting with the surrounding environment [11].

Most people often view creativity as a skill rooted in natural talent, assuming that only gifted individuals can be creative. While some people seem to possess the ability to generate new ideas quickly and diversely, this perspective is not entirely accurate. In reality, everyone has the capacity for creative thinking.

According to Wiyono [12], creativity needs to be instilled, nurtured, and developed in children for several fundamental reasons. First, through creative activities, children have the opportunity to express themselves. Self-actualization is one of the basic human needs that is important to fulfill in the process of personal development. Second is the ability to think creatively, which allows for various ways to solve problems. Sharing opinions with others without limits will be able to generate various ideas. Third, involvement in creative activities can provide a sense of satisfaction for individuals. This aspect is important to note, because the level of satisfaction achieved by a person also influences their social and emotional development. Fourth, by being creative, people can improve their quality of life.

Indicators of learning creativity [3] :

1) Fluency of thinking : reflects the ability of students to generate many ideas and ask various questions during learning.
2) Flexibility of thinking : the ability of students to see problems from various perspectives, explore ideas, and change approaches in completing tasks.
3) Elaboration: the ability of students to develop ideas in depth by adding details to make them more meaningful and easier to understand.
4) Originality: the ability of students to independently generate unique and different ideas, with answers that are uncommon or rarely thought of.
5) Evaluation: the ability of students to assess and select the best solutions and evaluate the learning process and outcomes for improvement.

C. *Learning Outcomes*

Learning outcomes are changes in students from not understanding to understanding, which occur from the beginning to the end of the learning process, and include the cognitive, affective, and psychomotor skills that students have acquired, which are assessed by teachers in the form of grades as learning outcomes from the learning process during that period [13]. Learning outcomes are generally identified through scores or grades obtained by students on daily tests after the competencies in a subject have been taught.

One component of learning outcome assessment is in the cognitive domain, which is more closely related to brain and mental activities. This domain consists of six levels of thinking processes, known as Bloom's Taxonomy, which was modified by Rin W. Anderson and David R. Krathwohl.

Learning outcomes refer to the abilities possessed by students after participating in the learning process. Referring to the Taxonomy of Educational Objectives theory proposed by Benjamin S. Bloom, educational objectives are divided into three main domains: cognitive, affective, and psychomotor [14].

In this study, the researcher focused on the cognitive domain because the learning outcome indicators used were obtained from daily test scores on digital literacy elements with core material on search engines in the Informatics subject.

The cognitive domain refers to behavioral changes during the learning process or activities that begin with gathering impulses, conveying, and processing information in the brain. Learning outcomes in the cognitive domain encompass various stages, ranging from the simplest level, such as observing, to the most complex level, such as evaluating. This domain is related to students' intellectual abilities, which include aspects of knowledge, understanding, and thinking skills. Examples include the ability to calculate, read, remember, and repeat learning outcomes, and evaluation is conducted through tests or quizzes [15].

The learning outcome indicators in this study focus on the cognitive domain because the indicators used are derived from daily quiz scores on digital literacy elements with core material on search engines in the Informatics subject.

III. RESEARCH METHODOLOGY

This study was conducted using a quantitative data analysis approach. The aim was to summarize and present data using statistical methods.

Quantitative research aims to make predictions based on numerical data analyzed using statistical methods. This research uses a quantitative method with a survey approach as its data collection technique. In this method, the researcher observes a particular event or situation and then examines the data obtained to gain a deeper understanding. The research process begins with collecting information from the field, then the researcher conducts a survey using a questionnaire, and finally draws conclusions or generalizations based on the observations. This research aims to measure the influence of independent variables (internet use and student learning creativity) on dependent variables (learning outcomes in computer science). This approach is simple and focuses more on understanding the context and experiences of the research subjects [16].

A. *Population and Sample*

Sugiyono (2014) explains that in quantitative research, the population is the area of generalization consisting of objects or subjects with certain characteristics and qualities that have been determined by the researcher to be studied and then used as a basis for drawing conclusions. In this study, the population used was all tenth-grade students at SMKN 2 Tulungagung in the 2024/2025 academic year. The research focuses on students in grade X as the primary subjects for data collection because the subject of Computer Science is only taught in grade X. Therefore, the population for the research titled “The Influence of Internet Use and Students' Learning Creativity on Academic Achievement at SMKN 2 Tulungagung” is all students in grade X.

According to Sugiyono (2014), a sample is a part of the population selected to represent the entire population. A sample consists of a number of individuals selected from the population and is considered to represent the characteristics of the entire population. If the population size is too large and it is not feasible to study the entire population due to time, manpower, or cost constraints, using a sample becomes the appropriate solution. Therefore, the sample used must be truly representative of the target population so that the research results can be generalized.

According to Renggo & Reny [17], if the population size reaches 100 people or more, the sample that can be taken is 10% of the total population of 738 students divided into 20 classes, resulting in a sample of 74 students.

There are various sampling techniques that can be used, depending on the purpose and conditions of the research. In this study, the researcher applied the simple random sampling technique. Thus, every individual in the population has an

equal chance of being studied, because the entire population is used as the research subject [18].

B. Data Collection Techniques

In conducting research, the data collection process is a very important stage in obtaining results that are in line with the objectives that have been set. In this study, the method used is the survey method. The data collection technique applied is through questionnaires. A questionnaire is a data collection method that involves presenting respondents with a set of written questions, which they are then asked to answer in a measurable way, either by filling in the answers directly or by selecting from the provided answer options[19]. Respondents are asked to provide measurable responses by filling in blank spaces or using predetermined answer options. In quantitative research, questionnaires are used to collect data from larger samples.

Table 3. 1 Research Instrument Indicators

Variable	Indicators	Types of Instruments
Internet Usage (X_1)	1. Intensity 2. Usefulness 3. Effectiveness [9] 4. Purpose of internet use 5. Skills in using the internet for learning 6. Barriers to using the internet for learning [10]	Questionnaire
Student Learning Creativity (X_2)	1. Fluency of thought 2. Flexibility of thought 3. Elaboration 4. Originality 5. Evaluation [3]	Questionnaire
Learning Outcomes (Y)	1. Daily test scores for digital literacy elements with core material on search engines	Documentation/ Value

To support data measurement, a Likert scale was used, which provided answer options ranging from very positive to very negative for each statement in the instrument [20]. In addition to the questionnaire, student exam score documents were also used to supplement data on learning outcomes.

Table 3. 2 Likert Scale

SCALE	STATEMENT SCORE	
	POSITIVE	NEGATIVE
Strongly agree	4	1
Agree	3	2
Disagree	2	3
Strongly Disagree	1	4

C. Instrument Validity and Reliability

using SPSS software version 24. There were 31 respondents, with 18 statements testing the variable of internet use and 12 statements testing the variable of student learning creativity. The test was conducted 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 a Cronbach's Alpha value > 0.600, then the variable can be said to be consistent or reliable in its measurement.

D. Data Analysis Hypothesis Testing

In this study, classical assumption testing included normality testing, homogeneity testing, multicollinearity testing, heteroscedasticity testing, and linearity testing. Furthermore, hypothesis testing was conducted through two approaches, namely partial testing (T-test) and simultaneous testing (F-test).

IV. RESEARCH RESULTS

A. Presentation of Research Results Data

This study was conducted to determine the effect of internet use and student learning creativity on the learning outcomes of 10th grade students in Informatics at SMKN 2 Tulungagung. The sample size for this study was 10% of the total 740 students, resulting in 74 students. The validity test used in this study was conducted on Grade 10 Office Management Class 1, with 34 students, minus 3 students selected as the sample, resulting in 31 respondents.

The data obtained from this study included questionnaire data on internet usage and student learning creativity for learning outcomes in the subject of Informatics in the element of digital literacy with the core material of search engines. The data on scores was obtained through documentation of students' daily test results, which included assessments of cognitive aspects.

B. Hypothesis Testing Data Analysis

1) Classical Assumption Test

The normality test based on SPSS testing obtained a significance value of 0.08 > 0.05, indicating that the data is normally distributed. Based on the results of the homogeneity test, it was found that the variables of internet usage (X_1) and student learning creativity (X_2) on learning outcomes (Y) obtained a significance value of 0.248, indicating that the data is homogeneous. Based on the results of the multicollinearity test, it was found that the correlation between the independent variables X_1 and X_2 had a VIF value of 1.339 < 10 and a Tolerance value of 0.803 > 0.1, indicating that there was no multicollinearity among the independent variables. Based on the results of the heteroscedasticity test, variable X_1 obtained a significance value of 0.512 > 0.05 and variable X_2 obtained a significance value of 0.746 > 0.05, so it can be concluded that the independent variables in this study did not exhibit heteroscedasticity. Based on the results of the linearity test, variable X_1 obtained a significance value of 0.804 > 0.05 and variable X_2 obtained a significance value of 0.097 > 0.05, so there is a linear relationship between the independent variables and the dependent variable (Y).

2) Hypothesis Testing

The partial test (T) of the internet usage variable (X_1) obtained a significance value of 0.014 < 0.05 and T_{hitung} 2.526 > T_{tabel} 1.997, so it can be concluded that variable X_1 has a significant effect on student learning outcomes (Y). $H_0$1 is rejected and H_a1 is accepted. The student learning creativity variable (X_2) obtained a significance value of 0.374 > 0.05 and T_{hitung} 0.896 < T_{tabel} 1.997, so it can be concluded that the student learning

creativity variable (X_2) does not significantly affect student learning outcomes (Y). $H_0$2 is accepted and H_a2 is rejected.

Simultaneous Test (F) The results of the F test indicate that variables X_1 and X_2 obtained an Fcount of 5.724 with a significance value of 0.005 < 0.05, so it can be concluded that variables X_1 and X_2 significantly influence learning outcomes (Y). $H_0$3 is rejected and H_a3 is accepted.

C. Discussion of Research Results

1) The results of the T-test indicate that there is a significant partial effect between internet use and learning outcomes in the Computer Science subject for 10th-grade students at SMK Negeri 2 Tulungagung. According to the researcher, the use of the internet facilitates access to information, enables hands-on practice, and provides a variety of learning media. This contributes to improved understanding, skills, and learning outcomes for students in the Computer Science subject.

   This is also supported by research conducted by Nazzala, [21] entitled "The Effect of Internet Use as a Learning Resource on Learning Outcomes in Computer Systems for Grade XI Multimedia Students at SMK 11 Semarang." The research concluded that there is an effect of internet use as a learning resource on the learning outcomes of Grade XI Multimedia students at SMK Negeri 11 Semarang.

2) The results of the T-test indicate that there is no partial influence between students' learning creativity and their learning outcomes in the Informatics subject for 10th-grade students at SMK Negeri 2 Tulungagung. According to the researcher, there is no influence of students' learning creativity on the learning outcomes of the Informatics subject for 10th grade students at SMK Negeri 2 Tulungagung because the Informatics subject fundamentally emphasizes mastery/understanding of learning materials rather than the development of creativity. Therefore, students' learning creativity does not become a dominant aspect that influences learning outcomes.

   The results of this study are also supported by the research conducted by Sasmita et al., [22] with the title "The Influence of Learning Interest, Learning Style, and Student Learning Creativity on the Learning Outcomes of Grade X Students in Basic Graphic Design at SMK PGRI 2 Malang." In that study, the variable of student learning creativity had no effect on student learning outcomes.

3) The results of the F-test indicate that there is a significant simultaneous influence between internet use and students' learning creativity on the learning outcomes of the Informatics subject for Grade X students at SMK Negeri 2 Tulungagung. According to the researcher, the influence of internet use and student learning creativity on the learning outcomes of Grade X students in the Informatics subject at SMK Negeri 2 Tulungagung is influenced by the use of the internet as a learning tool, which provides easy access to various sources of information and relevant learning materials. However, its effectiveness depends heavily on students' ability to use the internet positively and productively. On the other hand, students' learning creativity, such as the ability to think critically, find new ideas, and solve problems, encourages students to play an active role during the learning process. Therefore, students' learning outcomes will improve if the use of the internet and learning creativity are optimized and supported by conducive learning conditions.

   The results of this study are also supported by research conducted by [2] entitled "The Effect of Internet Use on the Interest and Learning Outcomes of Eighth Grade Students at SMP Negeri Kualuh Selatan," which identified that there is an effect of internet use on the interest and learning outcomes of eighth grade students at SMP N.1 Kualuh Selatan. This research is also supported by research conducted by Wiyono (2018) entitled "The Influence of Student Motivation and Learning Creativity on Civic Education Learning Outcomes," which found that learning creativity contributes significantly to improving student learning outcomes.

CONCLUSION

From the results of the research and discussion described above, the following conclusions can be drawn:

1) There is a significant partial influence between internet use and the learning outcomes of 10th grade students at SMKN 2 Tulungagung.

2) There is no significant partial influence between student learning creativity and the learning outcomes of 10th grade students at SMKN 2 Tulungagung.

3) There is a significant simultaneous influence between internet use and student learning creativity on the academic performance of 10th grade students at SMKN 2 Tulungagung.

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