Prisma Sains: Jurnal Pengkajian Ilmu dan Pembelajaran Matematika dan IPA IKIP Mataram
https://e-journal.undikma.ac.id/index.php/prismasains/index
e-mail: prismasains.pkpsm@gmail.com

October 2022. Vol. 10, No. 4
p-ISSN: 2338-4530
e-ISSN: 2540-7899
pp. 831-841

The Impact of Digital Literacy and Risk Internet Behavior on Science Learning Achievement: A Case Study of Students at Junior High School 1 Kendari

[a] Sitti Hajar, [*b]Aceng Haetami, [c] Muzini
[a]Department of Science Education, Postgraduate Program; [b]Department of Chemistry Education; [c]Department of Biology Education, Faculty Teaching Training and Education Universitas Halu Oleo, Kendari, Indonesia 93231
*Corresponding Author e-mail: acenghaetami@uho.ac.id

Received: August 2022; Revised: September 2022; Published: October 2022

Abstract

Today's main problem is the lack of literacy in the learning process. The use of literacy is defined as a pattern to foster and develop the process of reasoning and thinking. Currently, many children do not have literacy skills, one of which is digital literacy. Digital literacy among students and schools is often misused or misinterpreted, especially in the use of the digital internet. This study aims to describe digital literacy, risk internet behavior, and science learning achievement, as well as the simultaneous and partial influence of digital literacy and risk internet behavior on science learning achievement. This research is classified as quantitative research using the survey method. The population in this study were all students of Junior High School 1 Kendari in the 2020/202 academic year. The sampling technique in this study is proportionate stratified random sampling, i.e., population members are taken at random and proportionally stratified, consisting of classes VII, VIII, and IX. The number of samples obtained was 284 samples. The results showed that the average digital literacy of students was included in the reasonably high category, and the average risk internet behavior of students was included in the good category, meaning that they could control the bad risks arising from using the internet. The average science learning achievement of students was included in the high category. Multiple linear regression test results show that digital literacy and risk internet behavior simultaneously significantly affect science learning achievement, with a contribution of 9.4%. And the results of a simple linear regression test show that digital literacy does not substantially affect science learning achievement. This is because the contribution of digital literacy is very small, namely 0.04%, so statistically, digital literacy has no significant or no effect on science learning achievement. Meanwhile, risk internet behavior significantly influences science learning achievement, contributing 9.15%. Based on the analysis results, the internet's use had an impact on student achievement in school. It is because many students use the internet as a learning resource.

Keywords: Digital Literacy, Internet-Risk Behavior and Science Learning Achievement

How to Cite: Hajar, S., Haetami, A., & Muzini, M. (2022). The Impact of Digital Literacy and Risk Internet Behavior on Science Learning Achievement: A Case Study of Students at Junior High School 1 Kendari. *Prisma Sains : Jurnal Pengkajian Ilmu dan Pembelajaran Matematika dan IPA IKIP Mataram, 10*(4), 831-841. doi:https://doi.org/10.33394/j-ps.v10i4.5783

https://doi.org/10.33394/j-ps.v10i4.5783

INTRODUCTION

One of the nations having the highest percentage of internet users worldwide is Indonesia. According to an Association of Indonesian Internet Service Providers (APJII) survey conducted in 2020, 55 million children and teenagers in Indonesia use the internet (Rakhmawati & Suryandari, 2021; Sumila et al., 2020). The presence of the internet in education creates changes in the teaching and learning process (Coman et al., 2020). One of the changes that have arisen related to the presence of the internet is the shift in physical learning facilities to digital learning, such as the availability of digital libraries, electronic journals, electronic books, and others, and the emergence of the concept of e-learning, innovations in digital-based learning media and digital technology-based classes (Kurniawati

& Baroroh, 2016). In digital learning, students must have good digital literacy skills to understand and utilize information from various forms and sources accessed via the internet. Students who master digital literacy will understand how to use digital media to gain knowledge (Sumiati & Wijonarko, 2020).

The science learning process needs to use the help of concrete objects so that students have a good conceptual understanding of the state of nature (Chan, 2017). These tangible objects are not always easy to obtain, so digital media are needed to explain them. Digital media can display images, video, animation, sound, and text in an integrated display (J. Liu, 2020; Wina, 2010). The use of digital media as a learning tool makes the student's learning experience more meaningful and not easily forgotten, so good digital literacy skills are expected to improve students' learning achievement in science (Akhyar et al., 2021; Sanova et al., 2022). Kendari City is one of Indonesia's top 20 cities for digital literacy. According to a poll by the Katadata Insight Center and Ministry of Communication and Information Technology in 2020, Kendari is ranked 17th among Indonesia's major cities. Additionally, the city of Kendari is still working to raise student digital literacy. One of them is the formal introduction of an electronic library application (e-library) for junior high schools in the city of Kendari by the Kendari city government (Lotunani, 2021)

Based on the researcher's observations, Junior High School 1 Kendari developed a blended learning model during the COVID-19 epidemic, a technique that blends offline or face-to-face learning with online learning utilizing digital media. Because the given learning resources are simpler for students to understand, blended learning seeks to provide a meaningful learning experience (Ellis et al., 2006; Garrison & Kanuka, 2004). The model can be carried out not only during the face-to-face learning process but also during activities outside of face-to-face activities, either in the school environment, at home, or in other places with internet access (Dobrzański & Brom, 2008). However, despite all the advantages that digital media offers, engaging in harmful internet conduct is typical. Risk is the probability that a bad thing will happen, which makes it possible for something terrible to happen. Consequently, the risk of internet activity is the prevalence of unwelcome negative internet behaviors (Livingstone et al., 2011). Internet-based risk behaviors include sharing personal information, reading offensive or hateful content, engaging in cyberbullying, and watching pornographic material (Luthfia, 2015). According to pages on kompas.com, from 2013 to 2015, youths between the ages of 14 and 19 were responsible for at least 12 criminal incidents. The victims, who were young ladies, were abducted and subjected to sexual harassment due to the criminal occurrence. The victim was discovered to have only known each other for a short time on Facebook before agreeing to meet up in person and ultimately being a victim of crime (Luthfia, 2015).

In their study, Lestari & Suherni (2015) reported that 60 adolescents aged 13-24 years in Yogyakarta showed that 63% accessed pornography via the internet. Another study in Madura on 80 junior high school students showed that 91% of participants were accidentally exposed to pornographic content when accessing the internet, and 35% admitted to accessing it intentionally (Ramadani, 2019). Even in the Central Highlands of Papua, some teenagers are prone to having sex since junior high school when they begin to recognize attraction to the opposite sex and start dating. Moreover, the circulation of pornographic videos, primarily via cell phones, is increasingly widespread. "After seeing pornographic videos, many friends want to do it," said Salemi, a grade IX student in Wamena (Luthfia, 2015). Adolescents' ability to access porn sites is learned from their peers, who at first used the internet to search for the subject matter and school assignments (Qomariyah, 2009)

Risk internet behavior hurts students, ranging from addiction to social media sites to time-lapsed internet use. This negative impact, in general, can interfere with rest time, the ability to concentrate, and ignore other habits/behaviors, including studying (Barlett et al., 2012). Student learning behavior can affect learning achievement, especially in science subjects. This situation is in line with research conducted by Murti (2019) that study habits

and student learning behavior have a favorable and significant impact on how well students learn science. While Purnama et al. (2021)said that although it provides a positive side, learning using the internet is detrimental to online risks for users, especially children. The most common drawback is the lack of interaction between peers and teachers, which promotes inadequate communication skills. As a result, gaps in digital literacy can lead to educational inequalities and, in turn, amplify inequalities in the labor market. Indeed, the available evidence shows substantial differences in digital literacy (Pagani et al., 2016). Moreover, using digital literacy at the junior high school level in the city of Kendari is a problem. It is because children access more things that are not natural than things that are the subject of learning. What worries me the most is that children are more likely to access pornographic content than lesson content. It will undoubtedly have an impact both in terms of student cognitive abilities and student behavior.

The author is therefore interested in researching the effects of digital literacy and internet risk behavior on the science learning achievement of Junior High School 1 Kendari students based on the description that has been provided. This study is anticipated to provide data on literacy rates in the city of Kendari, particularly in Junior High School 1 Kendari. This study aims to be a source of information regarding the importance of digital literacy, especially in optimizing internet use for student achievement

METHOD

This study used a quantitative research design and a survey approach, and it was carried out at Junior High School 1 Kendari. The population of this study consisted of all 984 students enrolled in Junior High School 1 Kendari for the 2021–2022 academic year. The sampling strategy used in this study, proportionate stratified random sampling, involves randomly selecting samples from the population and proportionally stratifying them. Equation (1,2,3) gives the number of samples for classes VII, VIII, and IX as 95, 86, and 103.

$$\text{Total sample (n)} = \frac{\text{N}}{1 + (\text{N} \times \text{d}^2)} \quad (1)$$

where: n = total sample; N= number of samples; d^2 = Set precision. With 5% precision, the number of samples is obtained (Equation 2)

$$\text{n} = \frac{984}{1 + (984 \times 0{,}05^2)} = 284 \text{ respondent} \quad (2)$$

Sampling by proportional random sampling using the proportional allocation formula according to Sugiyono (2014)

$$\text{n}_\text{i} = \frac{\text{N}_\text{i}}{\text{N}} \times \text{n} \quad (3)$$

Where, n_i = Number of samples by class; n= Total number of samples; N_i = Total population by class; N = Total population.

The independent variables in this study are digital literacy (X_1) and risk internet behavior (X_2). While the dependent variable is science learning achievement (Y). Data collection techniques were carried out using questionnaires and documentation. Questionnaires are used to obtain information from respondents regarding digital literacy data and risk internet behavior data. Documentation is used to take evidence of the ongoing research process.

The instrument trial was conducted to determine whether the instruments used to measure digital literacy and risk internet behavior were appropriate and able to measure respondents' attitudes to the research objectives. This trial was conducted to determine how much validity and reliability an instrument has. Instrument sebelu digunakan dan di uji coba terlebih dahulu di validasi oleh pakar. It seeks to pay attention to things that are following the

objectives to be achieved so that the questions are not far from context. Validity testing is carried out with two tests, namely construction validity testing and content validity testing. Testing the construction's validity is done using experts' opinions. The minimum number of experts used is three people (Sugiyono, 2014). Construction validity is calculated using the coefficient V Aiken formula (Equation 4).

$$s = r_i - l_0 \qquad V = \frac{\sum s}{n\,(c-1)} \tag{4}$$

Where, r = Validity assessment score from validator; l_0 = Lowest validity rating; c = Highest validity rating; n = Number of validators. V Aiken validity criteria: Value < 0.4: less valid; Value 0.4-0.8: Medium validity; Value > 0.8: Very valid (Retnawati, 2016).

The instrument used is a closed questionnaire. This questionnaire is presented as a Likert scale with four alternative answers. Respondents only need to put a checklist (√) on the alternative answers that match their characteristics. The characteristic of the Likert scale is that the higher the score obtained by a respondent indicates that the respondent has a more positive attitude toward the object to be studied (Sugiyono, 2014). The scores for each alternative answer given by the respondents to the questions are shown in Table 1.

Table 1. Questionnaire answer rating scale

No.	Answer	Question item score	
		Favorable (Positive)	Unfavorable (Negative)
1.	Always (SL)	4	1
2.	Often (S)	3	2
3.	Rarely (J)	2	3
4.	Never (TP)	1	4

The digital literacy instrument is a questionnaire developed by Ministry of Communication and Information Technology 2020, which refers to the framework for measuring digital literacy by UNESCO 2018. The internet risk behavior instrument is a questionnaire designed by LSE Research Online 2012, which relates to standards for measuring risk internet behavior (Risks and safety on the Internet internet: the perspective of European children) by EU Kids Online Network 2011.

The data analysis technique used in this research is descriptive statistics and inferential statistics. Descriptive statistics are statistics used in analyzing data by describing the data by categorizing it. Inferential statistics are used to test statistical hypotheses through regression analysis using the SPSS 16.0 application.

RESULTS AND DISCUSSION

The results of the validity of the instruments analyzed using the standard eiken values are presented in Table 2.

Table 2. Result of analysis instrument using based eiken value

No	Indicator	Eiken Value	Information
1	Student achievement	0.77	Medium
2	Digital Literacy	0.76	Medium
3	Risky Internet Behavior	0.88	High

Based on the results of the analysis in the table, it is found that the instrument analysis is feasible to use with indicator values in the aspect of student achievement in the medium category (0.77), digital literacy 0.76 (medium) and Risky Internet Behavior of 0.88 high category. The results of the descriptive analysis of the digital literacy variable (X_1) in the

form of the minimum value, maximum value, average value, and standard deviation value can be seen in Table 3.

Table 3. Result of analysis descriptive

Descriptive Parameters	N	Minimum	Maximum	Average	Std. Deviation
Digital Literacy	284	37,5	95	67,394	11,312
Risk Internet Behavior	284	38	100	77,68	12,838
Student achievement	284	40	100	77,33	12,465

Analyzing data in Table 3 for the digital literacy variable reveals that the range of values is 37.5 to 95, with a mean of 67,394 and a standard deviation of 11.312 between the least and maximum values. With a mean value of 77.68 and a standard deviation of 12.838, the data characteristics of risk online behaviors varied from 38 to 100. The science learning achievement variable's data ranges from a minimum of 40 to a high of 100, with an average value of 77.33 and a standard deviation of 12,465.

Table 4. Digital literacy variable data categorization

No.	Category	Scale value	Frequency	Percentage
1.	High	$X > 75$	71	25%
2.	Pretty High	$62,50 < X \leq 75$	103	36%
3.	Low Enough	$50 < X \leq 62,50$	95	34%
4.	Low	$X \leq 50$	15	5%
Total			284	100%

According to Table 4, there are 71 students at Junior High School 1 Kendari who fall into the high category for digital literacy, 103 students who fall into the moderately high category for digital literacy, 95 students who fall into the low category for digital literacy, and only 15 students who fall into the low category. Thus, it can be said that, on average, students have a pretty high level of digital literacy. The category of online risk conduct is shown in Table 5.

Table 5. Data Categorization of risk internet behavior variables

No.	Category	Scale value	Frequency	Percentage
1.	Well	$X > 75$	172	60%
2.	Good Enough	$62,50 < X \leq 75$	71	25%
3.	Bad Enough	$50 < X \leq 62,50$	36	13%
4.	Bad	$X \leq 50$	5	2%
Total			284	100%

According to Table 5, 172 students at Junior High School 1 Kendariengage in risk internet behavior in the good category, 71 students who do so in the fairly good category, 71 students who do so in the fairly bad category, 36 students who engage in risk internet behavior in the bad category, and five students who do so in the bad category.

Table 6. Data Categorization of Science Learning Achievement Variables

No.	Category	Scale value	Frequency	Percentage
1.	Tall	$X > 66,67$	236	83%
2.	High Enough	$50 < X \leq 66,67$	37	13%
3.	Low Enough	$33,33 < X \leq 50$	11	4%
4.	Low	$X \leq 33,33$	0	0%
Jumlah			284	100%

As per Table 6, 236 Junior High School 1 Kendari students have high learning achievement in the science category (83%), 37 students who have high enough learning achievement in the science category (13%), 11 students (4%), who have pretty low learning achievement in the science category, and 0 students (0%), who have low learning achievement in the science category. Thus, it may be said that the average-based level of student accomplishment in science falls under the "high" category. The outcomes of a test to determine whether literacy and dangerous internet behavior impact science learning outcomes are shown in Table 7.

Table 7. Results of multiple linear regression analysis the effect of digital literacy (x_1) and internet-risk behavior (x_2) on science learning achievement

Regression analysis	Coefficient regreciont	F_{count}	Sig.	Contribution
Digital literation (X_1)	0,055	14,566	0,000	9,4%
Risk Internet Behavior (X_2)	0,299			

The hypothesis proposed in testing the effect of digital literacy (X_1) and risk internet behavior (X_2) simultaneously on science learning achievement (Y) is described as follows:

H_0 : There is no influence of digital literacy and risk internet behavior on science learning achievement.

H_1 : There is an influence of digital literacy and risk internet behavior on science learning achievement.

Based on Table 7, it is known that the value of a = 50,443, the regression coefficient value of b_1 = 0.055, and b_2 = 0.299. By entering the values of a, b_1, and b_2 into the multiple linear regression equation model $Y = a + b_1X_1 + b_2X_2$, the regression equation $Y = 50,443 + 0,055X_1 + 0,299X_2$ is obtained. The regression equation shows that every one unit increase in the digital literacy variable (X_1) and the risk internet behavior variable (X_2) will be followed by an increase of 0.055 + 0.299 in the science learning achievement variable (Y) with a constant of 50.443. And it is known that the F_{count} value is 14.566 > F_{table} 3.028, and the significant value is 0.000 <0.05. Following the basis of decision making in multiple linear regression analysis, if the value of $F_{count} > F_{table}$ or if the value of Sig. < 0.05, then H_1 is accepted, and H_0 is rejected. This means that the regression coefficient of digital literacy (X_1) and risk internet behavior (X_2) on science learning achievement (Y) is significant. The conclusion that H_1 is true, meaning that there is an impact of digital literacy and dangerous internet conduct on scientific learning achievement, may be drawn from multiple linear regression analysis results. The impact of unsafe internet use and illiterate digital tools on scientific learning outcomes is 9.4%. At the same time, other factors outside this equation or factors that are not considered affect the remaining 90.6%.

In addition, the results of the hypothesis testing the influence of literacy and internet behavior are partially at risk on science learning achievement. Test the hypothesis of the effect of digital literacy variables (X_1) and risk internet behavior variables (X_2) partly on the science learning achievement variable (Y) using simple linear regression analysis. The results of simple linear regression analysis can be seen in Table 8.

Table 8. Results of simple linear regression analysis effect of digital literacy (X_1) and internet-risk behavior (X_2) on science learning achievement

Regression analysis	Coefficient regreciont	F_{count}	Sig.	Contribution
Digital literation (X_1)	0,021	0,100	0,752	0,04%
Risk internet behavior (X_2)	0,294	28,395	0,000	9,15%

The hypothesis proposed in the test of the influence of digital literacy (X_1) and internet risk behavior (X_2) partially on science learning achievement (Y) is described as follows: Testing the effect of digital literacy on science learning achievement H_0: There is no effect of digital literacy on learning achievement science. H_1: There is an influence of digital literacy on science learning achievement. Based on Table 8, it is known that the value of a = 75.932 and the value of the regression coefficient b = 0.021. By entering the values of a and b into the regression equation model Y = a + bX, the regression equation $Y = 75.932 + 0.021X_1$ is obtained. The regression equation shows that every one unit increase in the digital literacy variable (X_1) will be followed by an increase of 0.021 in the science learning achievement variable (Y) with a constant of 75.932. And it is known that the value of F_{count} is 0.100 < F_{table} 3.875 or a significant value of 0.752 > 0.05. By the basis of decision making in simple linear regression analysis, if the value of $F_{count} < F_{table}$ or if the value of Sig. > 0.05, then H_1 is rejected, and H_0 is accepted. This means that the digital literacy regression coefficient (X_1) on science learning achievement (Y) is insignificant.

Based on the results of a simple regression analysis of the effect of digital literacy (X_1) on science learning achievement (Y), it can be concluded that H_0 is true; that is, there is no effect of digital literacy on science learning achievement. This is due to the small contribution of the influence of digital literacy on science learning achievement, which is 0.04%. Test the Effect of Risk Internet Behavior on Science Learning Achievement

H_0 : There is no influence of risk internet behavior on science learning achievement.
H_1: There is an influence of risk internet behavior on science learning achievement.

Based on Table 8, it is known that the value of a = 54.518, and the value of the regression coefficient b = 0.294. By entering the values of a and b into the regression equation model Y = a + bX, the regression equation $Y = 54.518 + 0.294X_2$ is obtained. The regression equation shows that every one unit increase in risk internet behavior variable (X_2) will be followed by an increase of 0.294 in the science learning achievement variable (Y) with a constant of 54.518. And it is known that the F_{count} 28.395 > F_{table} 3.875 or a significant value of 0.000 <0.05. Following the basis of decision making in simple linear regression analysis, if the value of $F_{count} > F_{table}$ or if the value of Sig. < 0.05, then H_1 is accepted, and H_0 is rejected. This means that the regression coefficient of risk internet behavior (X_2) on science learning achievement (Y) is significant. Based on the results of a simple linear regression analysis of the influence of risk internet behavior (X_2) on science learning achievement (Y), it can be concluded that H_1 is correct; that is, there is an influence of risk internet behavior on science learning achievement. The magnitude of the contribution of the influence of risk internet behavior on science learning achievement is 9.15%. In contrast, the remaining 90.85% is influenced by other variables outside this equation or variables that are not examined.

The data analysis's findings prove that students in Junior High School 1 Kendari are much less successful in learning science when digital literacy and unsafe online usage are combined. The impact of hazardous internet use and illiterate digital tools on scientific learning outcomes is 9.4%. In contrast, other factors or factors that are not considered have an impact on the remaining 90.6%. The degree to which students are motivated and interested in using digital media for scientific learning determines the amount of the influence of other factors that affect science learning achievement. This is to the research results Huang et al. (2021); Su & Cheng (2015) demonstrate that motivation and enthusiasm in learning science using digital media have a favorable and significant impact on scientific learning success. Student motivation to utilize digital media (macro flash animation) in science learning

influences learning achievement, and student motivation to use digital media in science learning can increase science learning achievement (Saripudin et al., 2018).

After using a digital media enriched learning program for high school science, students' science knowledge increased significantly from the pretest to the posttest. They were motivated and enjoyed the experience, and a significant positive relationship was found between students' motivation scores and their science knowledge posttest scores. Students' science learning achievement is positively and significantly impacted by their interest in digital literacy, contributing 20.3% (M. Liu et al., 2011). According to Wahab (2016), learning achievement is the level of success of students in studying subject matter at school, which is expressed in the form of scores obtained from test results regarding a certain number of materials.

Several factors influence student learning outcomes in schools, namely internal and external factors. Internal factors are factors from within a person that can affect learning achievement, namely interest, motivation, talent, and intelligence (Siregar & Lisma, 2019; Sukendar et al., 2018). Students will find their means to attain satisfying learning outcomes if they have good interests, drive, talent, and intelligence, such as by persistently carrying out study activities and attempting to find material outside of textbooks, such as by using the internet. Students will find it simpler to obtain knowledge with digital literacy, which depends on cutting-edge technology, in a more extensive range (Buckingham, 2007). Therefore, students have a broad perspective and can assist others in completing tasks, learning more in-depth, or both. Because they often utilize the internet, students develop digital literacy. They gain more advantages and encounter more threats when they use the internet more frequently. Risk is the probability that a bad thing will happen, which makes it possible for something terrible to happen. Consequently, the risk internet activity in question is the prevalence of unwelcome negative internet behaviors (Vandoninck et al., 2013)

Students at Junior High School 1 Kendari have a pretty high level of digital literacy. The outcomes of statistical studies reveal no discernible relationship between digital literacy and success in science learning. This is because digital literacy has a 0.0% effect on how well students study science. Digital literacy's contribution to science learning accomplishment is so negligible that it is either not statistically significant or is not thought to have a statistically meaningful impact. So pupils with sufficient digital literacy do not significantly affect how well students learn science. The results of this study are supported by research conducted by Lin et al. (2019) that the results of linear regression analysis showed that there was no significant effect between digital literacy on students' learning achievement in science and showed a significant effect on learning achievement in mathematics, social science, and other subjects, but not for English, foreign languages and science. In their study, Zhang et al. (2021) reported that the results of linear regression analysis of digital literacy showed no significant effect between digital literacy and student achievement in science and showed a significant effect on learning achievement in mathematics and other subjects. Next, Miao et al. (2020) reported an insignificant influence between digital literacy and academic achievement. Moreover, Xu et al., 2012) said that although students have high digital literacy, they have good and bad learning achievements. So it can be concluded that digital literacy does not increase or decrease students' science learning achievement.

The risk of internet use for employees at Junior High School 1 Kendari is considered high. This occurred because most of Junior High School 1 Kendari's students use the internet for online coursework and class participation. The statistical study results indicate a significant link between internet usage and the ability of students to learn science. The proportion of internet usage that negatively affects learning outcomes for science is roughly

9.1%. Because of this, students with internet access risk significantly harming their ability to learn science. Accordingly, if students recognize the risks associated with internet use, their performance in learning science will be much better. Miao et al. (2020) his study write There is evidence of a significant risk that internet use poses to learning outcomes. Positive risks associated with using the internet can boost academic staff members' performance. Conversely, if staff members' control over the internet becomes more intense, their academic staff members' performance will also become more intense. And then, G. C. Huang et al. (2014) study results indicate a significant positive risk associated with using the internet for achievement learning.

CONCLUSION

Students in Junior High School 1 Kendari have a pretty high level of digital literacy (36%), good internet risk behavior (60%), and high science learning accomplishment (83%) on average. With a combined effect contribution of 9.4%, digital literacy and risk online activity considerably impact pupils' science learning achievement. Although student digital literacy is extremely strong, it has little impact on how well they study science. This results from the effect's negligible contribution, which is only 0.04%. Students' internet-risk behavior falls within the "good" category, indicating a strong desire to avoid or minimize the hazards of the internet. As a result, it considerably impacts their ability to learn science, contributing 9.1% of the time.

RECOMMENDATION

Recommendations for further researchers are to make connections related to internet use, attitudes, responses, and student behavior in the learning process

ACKNOWLEDGMENT

The authors would like to thank the Halu Oleo University postgraduate program for their support so that this study can be completed on time.

REFERENCES

Akhyar, Y., Fitri, A., Zalisman, Z., Syarif, M. I., Niswah, N., Simbolon, P., Purnamasari S, A., Tryana, N., Abidin, Z., & Abidin, Z. (2021). Contribution of Digital Literacy to Students' Science Learning Outcomes in Online Learning. *International Journal of Elementary Education*, *5*(2), 284. https://doi.org/10.23887/ijee.v5i2.34423

Barlett, N. D., Gentile, D. A., Barlett, C. P., Eisenmann, J. C., & Walsh, D. A. (2012). Sleep as a Mediator of Screen Time Effects on US Children's Health Outcomes. *Journal of Children and Media*, *6*(1), 37–50. https://doi.org/10.1080/17482798.2011.633404

Buckingham, D. (2007). Digital Media Literacies: Rethinking Media Education in the Age of the Internet. *Research in Comparative and International Education*, *2*(1), 43–55. https://doi.org/10.2304/rcie.2007.2.1.43

Chan, F. (2017). Implementasi Guru Menggunakan Metode Permainan Pada Pelajaran IPA Di Sekolah Dasar. *Jurnal Gentala Pendidikan Dasar*, *2*(1), 106–123. https://doi.org/10.22437/gentala.v2i1.6821

Coman, C., Țîru, L. G., Meseșan-Schmitz, L., Stanciu, C., & Bularca, M. C. (2020). Online teaching and learning in higher education during the coronavirus pandemic: Students' perspective. *Sustainability (Switzerland)*, *12*(24), 1–22. https://doi.org/10.3390/su122410367

Dobrzański, L. A., & Brom, F. (2008). E-learning on the example of materials science. *Journal of Achievement in Materials and Manucaturing Engineering*, *29*(1), 99–102.

Ellis, R. A., Steed, A. F., & Applebee, A. C. (2006). Teacher conceptions of blended learning, blended teaching and associations with approaches to design. *Australasian*

Journal of Educational Technology, *22*(3). https://doi.org/10.14742/ajet.1289

Garrison, D. R., & Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education. *The Internet and Higher Education*, *7*(2), 95–105. https://doi.org/10.1016/j.iheduc.2004.02.001

Huang, G. C., Unger, J. B., Soto, D., Fujimoto, K., Pentz, M. A., Jordan-Marsh, M., & Valente, T. W. (2014). Peer Influences: The Impact of Online and Offline Friendship Networks on Adolescent Smoking and Alcohol Use. *Journal of Adolescent Health*, *54*(5), 508–514. https://doi.org/10.1016/j.jadohealth.2013.07.001

Huang, S., Jiang, Y., Yin, H., & Jong, M. S. (2021). Does ICT use matter? The relationships between students' ICT use, motivation, and science achievement in East Asia. *Learning and Individual Differences*, *86*, 101957. https://doi.org/10.1016/j.lindif.2020.101957

Kurniawati, J., & Baroroh, S. (2016). Literasi Media Digital MahasiswaUniversitas Muhammadiyah Bengkulu. *Jurnal Komunikator*, *8*(No. 2), 51–66.

Lestari, A. Y., & Suherni, K. (2015). Hubungan Intensitas Mengakses Situs Porno dengan Perilaku Seksual Pranikah Remaja. *Jurnal Kesehatan Ibu Dan Anak*, *7*(1), 5–9.

Lin, C.-H., Kwon, J. B., & Zhang, Y. (2019). Online self-paced high-school class size and student achievement. *Educational Technology Research and Development*, *67*(2), 317–336. https://doi.org/10.1007/s11423-018-9614-x

Liu, J. (2020). Application of Digital Media Technology in Animation Design and Production. *Journal of Physics: Conference Series*, *1486*(4), 042035. https://doi.org/10.1088/1742-6596/1486/4/042035

Liu, M., Horton, L., Olmanson, J., & Toprac, P. (2011). A study of learning and motivation in a new media enriched environment for middle school science. *Educational Technology Research and Development*, *59*(2), 249–265. https://doi.org/10.1007/s11423-011-9192-7

Livingstone, S., Haddon, L., Görzig, A., & Ólafsson, K. (2011). Risks and safety on the internet: the perspective of European children: full findings and policy implications from the EU Kids Online survey of 9-16 year olds and their parents in 25 countries. *LSE, London: EU Kids Online*, *1*(1), 170. http://eprints.lse.ac.uk/33731/1/Risks and safety on the internet%28lsero%29.pdf

Lotunani, B. (2021). *Pemkot Kendari Luncurkan Aplikasi Perpustakaan Digital*. ZonaSultra. https://zonasultra.id/pemkot-kendari-luncurkan-aplikasi-perpustakaan-digital.html

Luthfia, A. (2015). Pendidikan Literasi Media untuk Menghadapi Risiko Online dan Jaringan Komunikasi Remaja di Internet. *CommLine*, *VI*(2), 143–159. https://jurnal.uai.ac.id/index.php/commline/article/view/610

Miao, T.-C., Gu, C.-H., Liu, S., & Zhou, Z. K. (2020). Internet literacy and academic achievement among Chinese adolescent: a moderated mediation model. *Behaviour & Information Technology*, *1*(1), 1–13. https://doi.org/10.1080/0144929X.2020.1831074

Murti, W. (2019). Pengaruh Perilaku Belajar Siswa Terhadap Prestasi Belajar Ipa Biologi Siswa Kelas Viii Smpn 4 Bantimurung. *Binomial*, *2*(1), 54–63.

Pagani, L., Argentin, G., Gui, M., & Stanca, L. (2016). The impact of digital skills on educational outcomes: evidence from performance tests. *Educational Studies*, *42*(2), 137–162. https://doi.org/10.1080/03055698.2016.1148588

Purnama, S., Ulfah, M., Machali, I., Wibowo, A., & Narmaditya, B. S. (2021). Does digital literacy influence students' online risk? Evidence from Covid-19. *Heliyon*, *7*(6), e07406. https://doi.org/10.1016/j.heliyon.2021.e07406

Qomariyah, A. N. (2009). *Perilaku Penggunaan Internet pada Kalangan Remaja di Perkotaan*.

Rakhmawati, Y., & Suryandari, N. (2021). Pelatihan " Cerdas Ber Internet " Bagi Orang Tua di Desa Burneh Bangkalan. *Jurnal Pengabdian Kepada Masyarakat*, *5*(2), 137–143.

Ramadani, S. D. (2019). Internet Dan Perilaku Seksual Remaja Pesisir Madura: Studi Cross Sectional Di Desa Branta. *Jurnal Dinamika Sosial Budaya*, *21*(2), 91. https://doi.org/10.26623/jdsb.v21i2.1621

Retnawati, H. (2016). *Validitas Reliabilitas dan Karakteristik Butir*. Parama Publishing.

Sanova, A., Bakar, A., Afrida, A., Kurniawan, D. A., & Aldila, F. T. (2022). Digital Literacy on the Use of E-Module Towards Students' Self-Directed Learning on Learning Process and Outcomes Evaluation Cources. *JPI (Jurnal Pendidikan Indonesia)*, *11*(1), 154–164. https://doi.org/10.23887/jpi-undiksha.v11i1.36509

Saripudin, E., Sari, I. J., & Mukhtar, M. (2018). Using Macro Flash Animation Media on Motion Material to Improve Learning Achievement for Learning Science in Junior High School. *Jurnal Penelitian Dan Pembelajaran IPA*, *4*(1), 68. https://doi.org/10.30870/jppi.v4i1.3316

Siregar, M. A. P., & Lisma, E. (2019). The Effect Of Disposition On Student Mathematics Learning Achievement In Medan State 28 Junior High School. *Journal of Community Research and Service*, *3*(1), 22. https://doi.org/10.24114/jcrs.v3i1.14402

Su, C.-H., & Cheng, C.-H. (2015). A mobile gamification learning system for improving the learning motivation and achievements. *Journal of Computer Assisted Learning*, *31*(3), 268–286. https://doi.org/10.1111/jcal.12088

Sugiyono. (2014). *Educational Research Methods Quantitative, Qualitative Approach and R&D* (First Edi). Alfabeta.

Sukendar, S., Endroyo, B., & Sudarman, S. (2018). Interest Students to be Productive Teachers Reviewed from Learning Achievement of Building Practices, Learning Achievement of Learning Practices and Learning Motivation. *Journal of Vocational and Career Education*, *3*(1). https://doi.org/10.15294/jvce.v3i1.14006

Sumiati, E., & Wijonarko. (2020). Manfaat Literasi Digital Bagi Masyarakat Dan Sektor Pendidikan Pada Saat Pandemi Covid-19. *Buletin Perpustakaan Universitas Islam Indonesia*, *3*(2), 65–80.

Sumila, A. M., Sarjana, W., Fitrikasari, A., & Sari, L. K. (2020). Hubungan derjat narsisme dengan kejadian kecanduan media sosial pada remaja. *Jurnal Ilmiah Kesehatan Jiwa*, *2*(2), 77–88.

Vandoninck, S., D'Haenens, L., & Roe, K. (2013). Online Risks. *Journal of Children and Media*, *7*(1), 60–78. https://doi.org/10.1080/17482798.2012.739780

Wahab, R. (2016). *Psikologi Belajar*. Rajawali Persada.

Wina, S. (2010). *Strategi Pembelajaran Berorientasi Standar Proses Pendidikan*. Kencana Publisher.

Xu, J., Shen, L., Yan, C., Hu, H., Yang, F., Wang, L., Kotha, S. R., Zhang, L., Liao, X., Zhang, J., Ouyang, F., Zhang, J., & Shen, X. (2012). Personal characteristics related to the risk of adolescent internet addiction: a survey in Shanghai, China. *BMC Public Health*, *12*(1), 1106. https://doi.org/10.1186/1471-2458-12-1106

Zhang, Y., Zhao, G., & Zhou, B. (2021). Does learning longer improve student achievement? Evidence from online education of graduating students in a high school during COVID-19 period. *China Economic Review*, *70*, 101691. https://doi.org/10.1016/j.chieco.2021.101691