A Study of Critical Thinking Skills, Science Process Skills and Digital Literacy: Reviewed Based on the Gender

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Abstract: The purpose of this study was to analyze and find out the effect of critical thinking skills and science skills on digital literacy of class VIII F and VIII G students of SMPN 7 Muaro Jambi in terms of gender. The research method used is a mixed method with an explanatory design. The sampling technique in this study was purposive sampling with a sample of 56 students. The instruments used were critical thinking skills essay tests, KPS observation sheets, digital literacy questionnaires, and interview sheets. The quantitative data analysis technique used is descriptive statistical analysis and inferential statistics, while the qualitative data analysis technique used is the Miles and Huberman technique. The results of multiple linear regression tests show that there is an influence of critical thinking skills and science process skills on digital literacy. From the interview results it is known that critical thinking skills, science process skills, and digital literacy are classified as good. So, it can be concluded that there is a significant influence between critical thinking skills and science process skills on students' digital literacy.

Keywords: Critical Thinking; Digital Literacy; Gender; Science Process Skills.

Introduction

Natural science is one of the compulsory subjects at the junior high school level. Natural science is a science that studies the universe and its contents and events that occur in the surrounding environment through a series of processes of scientific experience such as investigating, compiling and presenting concepts (Arieshandy et al., 2022; Jamaluddin et al., 2019; Mutmainnah et al., 2021). However, there are still many science learning applications that are only directed at achieving knowledge or mastery of concepts, causing students to only be able to memorize concepts in science, but not being able to apply every science concept learned when facing problems in everyday life in natural sciences (Hariri et al., 2019; Lestari et al., 2021; Wardani, 2020). Therefore, in natural learning (IPA), students need to have the ability to think critically in natural sciences lessons because they play an important role in solving a problem regarding science lessons (Heryadi, 2021; Nugraha, 2018). This shows that the natural

sciences as one of the sciences that play a role in improving critical thinking skills.

The ability to think critically is one of the skills that are required to be possessed by students in the 21st century (Anggraeni et al., 2021; Handayani et al., 2022; Hidayati et al., 2021). Critical thinking skills are very important for students in learning, especially in learning natural sciences. With the ability to think critically, students are able to interpret, understand, analyze, and solve problems in everyday life and make some appropriate decisions about what to do further (Jannah and Atmojo, 2022; Nur et al., 2022; Warsah et al., 2021). Critical thinking ability consists of several indicators, namely providing simple explanations, building basic skills, concluding, providing further explanations, building strategies and tactics (Hikmawati et al., 2021; Lestari et al., 2021). Besides the ability to think critically, there is also one skill that is required to be possessed by students in the 21st century, namely science process skills.

Science process skills are basic skills that need to be possessed by students in developing their potential in the learning process. Science process skills are the ability of students to apply a scientific method in understanding, developing science and finding knowledge (Fitriani et al., 2021a; Gasila et al., 2019; Lestari and Diana, 2018). Science process skills are divided into 2 types, namely basic science process skills and integrated process skills. Basic science process skills consist of observing, classifying, communicating, measuring, inferring, and predicting (Darmaji et al., 2019; Senisum, 2021). These science process skills can be developed by providing direct experience to students, one of which is through practicum activities or experiments (Ikhsan, 2020; Ningsi et al., 2021; Royani, Mirawati and Jannah, 2018). In addition to science process skills, there are other skills that every student needs to have, namely digital literacy.

Digital literacy is one type of literacy among various types of literacy advancements that arise from technological developments and advances. Digital literacy is the ability of each individual to understand and use information in various forms with an emphasis on critical thinking rather than information and communication technology skills (Oktavia and Hardinata, 2020; Reddy et al., 2020; Sitorus, 2019). Through digital literacy, information will be more easily accessible whenever and wherever it is needed by readers using devices connected to the internet network (Fauzi and Usmeldi, 2022; Fitriana, 2021; Novitasari and Fauziddin, 2022). Digital literacy is a battering ram with wide-open applications to make it easier for students and educators within its reach (Dewi et al., 2021; Nurilahi et al., 2022). Digital literacy is also an individual's ability to apply functional skills on digital devices so that he can find and select information, think critically, be creative, collaborate, communicate, and pay attention to electronic security and the evolving socio-cultural context, this shows that digital literacy is very important. play a role in training students' critical thinking skills. (Chairunisa and Zamhari, 2022; Dhewi and Ningrum, 2021).

There are several previous studies related to critical thinking skills that are relevant to the research I will be doing, namely research conducted by Khasani et al. (2019), shows that the critical thinking ability of grade VIII A students of SMPN 4 Belik on Newton's Law is still low. Furthermore, research by Trimawati et al. (2020) shows that the Integrated Science assessment instrument developed is feasible to use to improve students' critical and creative thinking skills. Furthermore, research conducted by Yuliantaningrum and Sunarti (2020) said that the HOTS question instrument to measure critical thinking skills, creative thinking, and problem solving in straight motion material was declared feasible to be

applied to students. Then, research by Meryastiti et al. (2022) said that the critical thinking skills of SMPN 1 Glenmore students who have taken the concept of energy and energy sources are in the medium category.

Likewise, there are several previous studies related to science process skills that are relevant to the research I will be doing, namely research conducted by Hamadi et al. (2018), shows that aspects of science process skills have not been applied optimally due to lack of teaching and learning time, do not yet have laboratories and student worksheets and low student motivation. Furthermore, research by Nurhayati et al. (2019), shows that the test questions developed are suitable to be used to measure students' science process skills in optics, pressure, and wave vibrations. Furthermore, research by Pramudiyanti and Munazir (2021) said that the science process skills of class VIII students at SMP Muhammadiyah 3 Bandar Lampung were in the sufficient category. Furthermore, research conducted by Santiawati et al., (2022) said that the science process skills of SMPN 2 Burneh students on the concepts of vibration, waves, and sound were included in the poor category.

Likewise, there are several previous studies related to digital literacy that are relevant to the research I will be doing, namely research conducted by Febliza and Oktariani (2020) shows that the three digital literacy questionnaires show high and very high reliability criteria. Furthermore, research by A'yun (2021) said that digital literacy skills and student collaboration skills in online science learning on the topic of the interaction of living things with their environment are in the high category. In addition, research by Waliyuddin and Sulisworo (2022) shows that the test instrument for measuring higher order thinking skills and digital literacy that has been made contains valid and reliable items.

Based on the description above, it can be concluded that the thing that distinguishes the research that has been carried out by previous researchers with the research that I do is in the material being measured or tested and the number of variables used. critical thinking skills, science process skills, and digital literacy, whereas previous research conducted research on science materials other than simple machines and only used one of the three variables that I studied. Thus, the development of critical thinking skills, science process skills, and digital literacy of students at the education level must continue to be carried out because in reality there are still students and teachers in the field who have not mastered critical thinking skills, science process skills, and digital literacy.

The questions of this research are based on the background that has been explained, namely: how are the students' critical thinking skills, science process skills

and digital literacy at SMPN 7 Muaro Jambi? and is there an influence between critical thinking skills and science process skills on digital literacy at SMPN 7 Muaro Jambi?

Therefore, it is necessary to conduct research with the aim of knowing whether there is an influence between critical thinking skills and science process skills on the digital literacy of class VIII students at SMPN 7 Muaro Jambi.

Method

The type of research carried out is mixed methods, namely methods that combine quantitative and qualitative research methods (Mahirullah et al., 2023). Mix methods are a method in which researchers collect, analyze quantitative and qualitative data in the same study, and aim at the breadth and depth of understanding and evidence (Senjaya, 2018; Wijatiningsih and Prasetyawan, 2019). The research design chosen was explanatory mixed methods designs, namely research methods that combine quantitative and qualitative research methods sequentially (Maison et al., 2018). In this design, the researcher collects and analyzes quantitative data first, then collects and analyzes qualitative data sequentially in one study.

The type of quantitative research used is descriptive quantitative research. Quantitative research is a type of research that produces data in the form of numeric or numbers and facts with the aim of establishing a cause and effect relationship between several variables (Ahmad et al., 2019). While qualitative research is a method used in answering research problems related to the data produced in the form of narratives with sources originating from interviews (Fitriani et al., 2021b). Interviews were conducted in a semi-structured manner, namely a combination of structured and unstructured interviews. This semi-structured interview provides an opportunity for researchers to explore more deeply the answers of informants, are free to add questions, and researchers can improvise on the questions that have been made (Andina, 2019).

The population in this study were all students of SMP Negeri 7 Muaro Jambi. While the sample is some part of the characteristics of the population (Astalini et al., 2022; Efriyenty, 2020). The samples in this study were students of class VIII F and class VIII G, totaling 56 students for question data, observation sheets, and questionnaires, while 4 students for interview data. The sample of this research was taken by using purposive sampling technique. Purposive sampling technique is a sample selection technique by including subjects who meet the research criteria into the study for a certain

period of time, so that the number of respondents can be met (Irawati et al., 2019).

The instruments used in this study were essay tests totaling 10 items of simple aircraft material, student observation sheets totaling 13 statements, digital literacy questionnaire sheets (questionnaire) totaling 28 statements, and interview sheets. The interview sheet consists of 6 questions. This interview question was addressed to 4 students. While the interview with one of the science subject teachers at SMPN 7 Muaro Jambi was 7 questions. Four observers assisted this research in assessing the students' science process skill observation sheets. The questionnaire used is a closed questionnaire. For the observation sheet using a Likert scale with four scales, namely very good with a score of 4, good with a score of 3, not good with a score of 2 and very bad with a score of 1. While the digital literacy questionnaire consists of five Likert scales, namely strongly agree (SS), agree (S), neutral (N), disagree (TS), and strongly disagree (STS). The grid of instruments for critical thinking skills, science process skills, and digital literacy are in Table 1.

The critical thinking ability test instrument is assessed according to the assessment rubric. For science process skills, it is equipped with a Likert scale where Very Not Good is given a score of (1), Not Good (2), Good (3), Very Good (4). Meanwhile, digital literacy is equipped with a Likert scale where Strongly Disagree is given a score of (1), Disagree (2), Doubtful (3), Agree (4), and Strongly Agree (5). For the category of critical thinking ability interval, science process skills and digital literacy are attached in Table 2.

The data analysis technique used in this research is quantitative data analysis and qualitative analysis. Quantitative data were analyzed and calculated through IBM SPSS Statistic 23 analysis with descriptive statistics and parametric inferential statistics in the form of assumption testing and hypothesis testing (multiple linear regression test). Descriptive statistical analysis was used by researchers to find tables for the distribution of frequency, mean, median, mode, range, percentage, maximum value, minimum value, while inferential statistical analysis was a statistical technique used to analyze sample data and the results were applied to the population (Zulaikha et al., 2021). While the hypothesis test (multiple linear regression test) is used to describe and see the effect of a dependent variable with 3 or more independent variables (Sari et al., 2020). However, before testing the hypothesis, the first assumption must be tested which includes the normality test and linearity test. While the qualitative data analysis technique uses the Miles and Huberman technique. This qualitative data analysis was carried out interactively and continuously until the data obtained were complete. Meanwhile, the qualitative data analysis

used refers to the concept of Miles and Huberman with the stages, namely data collection, data reduction, data presentation, and drawing conclusions (Melati et al., 2021: 3066). At the data collection stage, the researcher collects the required data (Rijali, 2018). At the data reduction stage, the researcher sorts the data into certain concept units, certain categories, and certain themes, so as to refine the data and information that have been obtained by the researchers (Rijali, 2018). At the data

presentation stage, researchers can present data in the form of text or narrative in the form of field notes, matrices, graphs, networks, and charts (Rijali, 2018). While the conclusion drawing or data verification stage, the researcher will draw conclusions from the findings of the existing data or facts, this conclusion drawing effort is carried out by the researcher continuously while in the field (Rijali, 2018).

Table 1. Grid of Critical Thinking Skills, Science Process Skills, and Digital Literacy

Critical Thinking		Science Process Skills		Digital Literacy	
Indicator	Total Question	Indicator	Total Statement	Indicator	Total Statement
Provide a elementary	2	Observation	1	The ability to use the internet	6
Basic Support	2	Classification	1	Knowledge of how web browsers work, bandwidth, http, html, and url	11
Inference	2	Measure	5	The ability to analyze information sources	5
Advanced Clarification	2	Predict	3	the ability to use various types of digital media	6
Strategy and Tactic	2	Communication	2		
		Infering	1		
Total	10		13		28

Table 2. Categories of Critical Thinking Ability, Science Process Skills, and Digital Literacy

Critical Thinking		Science Process Skills		Digital Literacy	
Interval	Category	Interval	Category	Interval	Category
0.00 - 12.50	Very Not Critical	13.00 - 22.75	Very Not Good	28.00 - 56.00	Very Not Agree
12.60 - 25.10	Not Critical	22.76 - 32.51	Not Good	57.00 - 85.00	Not Agree
25.20 - 37.70	Critical	32.52 - 42.27	Good	86.00 - 114.00	Agree
37.80 - 50.30	Very Critical	42.28 - 52.03	Very Good	115.00 - 143.00	Very Agree

Result and Discussion

Result

Based on research data, the novelty of this research is to see the effect of critical thinking skills and science process skills on digital literacy in terms of student gender. Analysis of descriptive statistical data on critical thinking abilities of students of class VIII F and class VIII G SMPN 7 Muaro Jambi can be seen in Table 3.

Based on Table 3, it is known that in class VIII F female students are superior to male students, with a percentage value of 77.80% in the very critical category. Whereas in class VIII G male students are superior to female students with a percentage value of 62.50% in the critical category. The results of the descriptive statistical data analysis of the science process skills of class VIII F and class VIII G can be seen in Table 4.

From the results of Table 5. it shows that in class VIII F female students are superior to male students with a percentage score of 66.67% in the good category.

Likewise, in class VIII G female students were superior to male students with a percentage score of 69.23% in the good category. The results of the descriptive statistical data analysis of digital literacy in class VIII F and class VIII G can be seen in Table 5.

Based on Table 6, it is known that the digital literacy abilities of students in class VIII F are outperformed by male students with a percentage value of 83.30% in the agree category. Likewise, in class VIII G male students are superior to female students with a percentage score of 75.00% in the agree category.

After analyzing descriptive statistical data, the next step is to analyze inferential statistical data using the assumption test, namely the normality test and linearity test which aims to see whether the data we use are normally and linearly distributed, while the hypothesis test is multiple linear regression test. The normality test results can be seen in Table 6

Table 3. Description of Critical Thinking Ability of Class VIII F and VIII G students.

Gender	Interval	Category	F	%	Mean	Median	Min	Max
Class VIII F								
Male	0.00 - 12.50	Very Not Critical	0	0.00%	35.88	36.00	32.00	39.00
	12.60 - 25.10	Not Critical	0	0.00%				
	25.20 - 37.70	Critical	13	72.20%				
	37.80 - 50.30	Very Critical	5	27.80%				
Female	0.00 - 12.50	Very Not Critical	0	0.00%	38.20	38.00	33.00	41.00
	12.60 - 25.10	Not Critical	0	0.00%				
	25.20 - 37.70	Critical	2	22.20%				
	37.80 - 50.30	Very Critical	7	77.80%				
Class VIII G								
Male	0.00 - 12.50	Very Not Critical	0	0.00%	31.68	31.50	22.00	40.00
	12.60 - 25.10	Not Critical	3	18.75%				
	25.20 - 37.70	Critical	10	62.50%				
	37.80 - 50.30	Very Critical	3	18.75%				
Female	0.00 - 12.50	Very Not Critical	0	0.00%	35.61	37.00	25.00	43.00
	12.60 - 25.10	Not Critical	1	7.60%				
	25.20 - 37.70	Critical	7	50.30%				
	37.80 - 50.30	Very Critical	5	42.10%				

Table 4. Description of Students' Science Process Skills in Class VIII F and Class VIII G

Gender	Interval	Category	F	%	Mean	Median	Min	Max
Class VIII F								
Male	13.00 - 22.75	Very Not Good	0	0.00%	41.44	45.62	36.51	49.32
	22.76 - 32.51	Not Good	0	0.00%				
	32.52 - 42.27	Good	10	55.56%				
	42.28 - 52.03	Very Good	8	44.44%				
Female	13.00 - 22.75	Very Not Good	0	0.00%	44.56	47.32	34.57	51.64
	22.76 - 32.51	Not Good	0	0.00%				
	32.52 - 42.27	Good	6	66.67%				
	42.28 - 52.03	Very Good	3	33.33%				
Class VIII G								
Male	13.00 - 22.75	Very Not Good	0	0.00%	40.67	45.36	33.52	50.40
	22.76 - 32.51	Not Good	0	0.00%				
	32.52 - 42.27	Good	10	62.50%				
	42.28 - 52.03	Very Good	6	37.50%				
Female	13.00 - 22.75	Very Not Good	0	0.00%	43.17	46.55	35.03	50.27
	22.76 - 32.51	Not Good	0	0.00%				
	32.52 - 42.27	Good	9	69.23%				
	42.28 - 52.03	Very Good	4	30.77%				

Table 5. Description of Digital Literacy for Class VIII F and VIII G Students

Gender	Interval	Category	F	%	Mean	Median	Min	Max
Class VIII F								
Male	28.00 - 56.00	Very Not Agree	0	0.00%	105.50	104.50	96.00	119.00
	57.00 - 85.00	Not Agree	0	0.00%				
	86.00 - 114.00	Agree	15	83.30%				
	115.00 - 143.00	Very Agree	3	16.70%				
Female	28.00 - 56.00	Very Not Agree	0	0.00%	113.70	116.00	99.00	122.00
	57.00 - 85.00	Not Agree	0	0.00%				
	86.00 - 114.00	Agree	4	44.40%				
	115.00 - 143.00	Very Agree	5	55.60%				
Class VIII G								
Male	28.00 - 56.00	Very Not Agree	0	0.00%	100.00	97.50	86.00	124.00
	57.00 - 85.00	Not Agree	0	0.00%				
	86.00 - 114.00	Agree	12	75.00%				
	115.00 - 143.00	Very Agree	4	25.00%				
Female	28.00 - 56.00	Very Not Agree	0	0.00%	109.60	116.00	82.00	128.00

Gender	Interval	Category	F	%	Mean	Median	Min	Max
	57.00 - 85.00	Not Agree	1	7.70%				
	86.00 - 114.00	Agree	4	30.80%				
	115.00 - 143.00	Very Agree	8	61.50%				

Table 6. Normality Test

		Kolmogorov-Smirnov[a]		
	Class	Statistic	df	Sig.
Critical Thinking	VIII F	.155	27	.200
	VIII G	.235	29	.119
Science Process Skills	VIII F	.176	27	.200
	VIII G	.232	29	.108
Digital Literacy	VIII F	.092	27	.200*
	VIII G	.218	29	.113

Normality test is a test carried out to find out whether the data we use is normally distributed or not by looking at its significance value. The normality test requirement is that the significance value must be greater than 0.05. Based on Table 6. it can be seen that the normality test of critical thinking skills in class F has a significance value of 0.200, while critical thinking skills in class G have a significance value of 0.119. While the normality test of science process skills in class F has a significance value of 0.200, while in class G with a significance value of 0.108. While the digital literacy normality test in class F has a significance value of 0.200, while in class G with a significance value of 0.113. The linearity test of critical thinking skills, science process skills and digital literacy can be seen in Table 7.

Table 7. Linearity Test

		Sum of Squares	Mean Square	F	Sig.
DL *SPS *CT	Deviation from Linearity	1102.667	55.133	2.079	.328

Based on Table 7. it can be seen that the Sum of Square value is 1102,667, the Mean Square value is 55,133 and F is 2,079 and the significance value is 0.328. The condition that needs to be met in the linearity test is that the significance value obtained must be greater than 0.05. So, based on the results of the significance value obtained, critical thinking skills, scientific process skills and digital literacy have a linear relationship. After testing the assumptions, it will be continued with hypothesis testing in the form of multiple linear regression which aims to determine whether there is an influence of critical thinking skills and science process skills on digital literacy of students at SMPN 7 Muaro Jambi. The results of the coefficient of determination can be seen in Table 8.

Table 8. The Result of Coefficient Determination

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.949[a]	.901	.897	5.54526

From Table 8. above shows that the value of the coefficient of determination or R Square is 0.901. The magnitude of the coefficient of determination (R Square) is 0.901 x 100% = 90.1%. That is, the variables of critical thinking ability, science process skills and digital literacy simultaneously affect 90.1%. Multiple linear regression test of critical thinking skills, science process skills on digital literacy can be seen in Table 9.

Table 9. Multiple Linear Regression Test Results

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-5.016	4.850		-1.034	.306
	Critical Thinking	.452	.129	.344	3.489	.001
	Science Process Skills	.887	.139	.628	6.363	.000

From Table 9. above, it can be seen that the regression equation for critical thinking skills can be obtained using the equation Y= a + b X and the equation Y = -5.016 + 0.452X, with a significance value of 0.001 <0.05 and t count = 3,489 > t table = 2,005, meaning that there is an influence of critical thinking ability on digital

literacy. While the regression equation for science process skills Y = -5.016 + 0.887X, with a significance value of 0.000 <0.05 and t arithmetic = 6.363 > t table = 2.005, meaning that there is an effect of science process skills on digital literacy.

After analyzing quantitative data from the results of the distribution of critical thinking ability essay questions, observation sheets of science process skills, and digital literacy questionnaires, so that the results of the questionnaire data are obtained quantitatively, the next step the researcher is to analyze qualitative data in the form of the results of researcher interviews with students, interviews This is as supporting data from the questionnaire data that has been obtained. Supported by the results of interviews with several students, it is known that students prefer to learn science using digital media such as video. In addition, based on the results of an interview with a science teacher, it is known that students' critical thinking skills, science process skills, and digital literacy can be categorized as quite good.

Discussion

Based on the results obtained from the descriptive statistical test, it can be seen from the distribution of critical thinking ability test instruments that have been carried out, it is found that in class VIII F female students are superior, while in class VIII G male students are superior in critical thinking. Where female students are able to provide explanations for the answers given, are able to find facts in solving problems given questions compared to female students. Besides that, female students are usually better able to think critically than boys because in women the areas of the brain associated with language function work harder which results in women's language skills being higher than boys, language is a tool used to convey thoughts, so the ability to use good language is an indicator of high thinking ability (Rahman et al., 2018).

Likewise with the results of the descriptive statistical test obtained from the results of the observation sheet assessment, it was found that class VIII F and class VIII G female students were more dominant than male sex in the good category. Science process skills are very important for developing students' scientific attitudes and solving problems, so as to form students who are creative, critical, open, innovative and competitive in global competition in society (Sulastri et al., 2021; Suwandari, Taufik and Rahayu, 2018). In line with the statement (Kurnia et al., 2021) in the process of thinking, female students are superior in terms of accuracy and thoroughness, in contrast to male students who tend to be less thorough and finish things too quickly. This shows that there are differences in the way of thinking of male and female students. Likewise with the results obtained from the

results of the digital literacy questionnaire assessment in class VIII F and VIII G, male students are superior to female students. Where male students understand more in choosing, using various digital media than female students.

After the results of the descriptive statistical test were obtained, then the assumption test was carried out using the normality test and linearity test. From the results of the normality test it is known that the data on critical thinking skills, science process skills, and digital literacy are normally distributed. While the results of the linearity test show that critical thinking skills, scientific process skills and digital literacy have a linear relationship. Then a hypothesis test was carried out in the form of multiple linear regression which aims to find out whether there is an effect of critical thinking skills and science process skills on digital literacy of SMPN 7 Muaro Jambi students. Based on the results of multiple linear regression hypothesis testing, it can be seen that there is an influence of critical thinking skills and science process skills on digital literacy skills.

Based on the results of interviews with several students in class VIII F and class VIII G as well as interviews with one of the science teachers at SMPN 7 Muaro Jambi, it is known that students' critical thinking skills are categorized as good, this is evidenced by students who are able to complete test questions or exams in science lessons, and students actively ask questions, and many students get pretty good grades and only a few students do remedial. Meanwhile, students' science process skills are also categorized as good, this is evidenced by the enthusiastic attitude of students in carrying out practicums, students are very happy to do practicums. Likewise, students' digital literacy can also be categorized as good, this is evidenced by students having mastered skills in using digital media well, and as a learning resource to increase knowledge at school and at home.

Critical thinking skills are very important for students to be more skilled in constructing arguments, checking the credibility of information sources, or making decisions (Yusuf et al., 2022). In addition, science process skills also play an important role for students to easily understand complex and abstract concepts when accompanied by practicum, this is because practicum increases student motivation, can develop basic skills, a vehicle for learning a scientific approach, and supports subject matter (Fatminastiti, 2021; Sriyati et al., 2021; Husna et al., 2021). Likewise, digital literacy is very important for students because literacy can support a person's success in dealing with various problems, add insight and new information, improve interpersonal skills, sharpen oneself in capturing the meaning of the information read, develop verbal skills, train thinking and analytical skills,

improve one's focus and concentration, practicing writing and compiling meaningful vocabulary.

There are several previous studies that are relevant to this research. However, there are differences in the focus of the research conducted, including research by Nuryanti et al. (2018), focusing on measuring critical thinking skills. Furthermore, research by Pratama et al. (2019), focuses on measuring students' digital literacy. Furthermore, research conducted by Ridho et al. (2020) focuses on measuring students' critical thinking abilities. Further research conducted by Chen et al. (2021) focuses on analyzing students' science process skills. Further research conducted by Rini et al. (2022) only focuses on measuring students' science process skills. From the results of a comparison between previous research and research that I conducted, it can be found differences in research focus and the number of variables used, where the focus of my research is to analyze the influence of the variables on critical thinking skills, science process skills, and digital literacy, and the number of variables that I use is three variables, whereas previous research only used one of the variables that I studied.

The novelty of this research is using gender as a separator to look at critical thinking skills, science process skills and digital literacy. As it is known that gender differences are factors that affect critical thinking skills, science process skills and digital literacy (Gasila et al., 2019; Nasihah et al., 2020; Prihatini and Muhid, 2021).

The short-term impact of critical thinking skills is that students can solve problems encountered in everyday life, and can make decisions effectively, while the long-term impact is that students can improve their mastery of concepts and learning outcomes (Prasetyono and Trisnawati, 2018; Syafitri et al., 2021). Meanwhile, the short-term impact of science process skills is that students can develop intellectual skills, manual skills and social skills, while the long-term impact is that students can improve cognitive, psychomotor, and attitude learning outcomes in science learning. (Siahaan et al., 2021; Wulandari et al., 2021). While the short-term impact of digital literacy skills is students can add new insights and information, improve verbal skills, improve analytical and thinking skills, while the long-term impact is digital literacy can improve students' critical and comprehensive thinking skills (Syaifuddin et al., 2022).

The researcher hopes that future research can examine more deeply the ability to think critically by increasing the number of questions and increasing the level of difficulty of the questions used to test students' critical thinking skills. In addition, it is expected to be able to examine other indicators of science process skills that were not examined in this study. Likewise, it is necessary to conduct research on other indicators of digital literacy outside of this study.

Conclusion

Based on the research conducted, it can be concluded that female students and male students are both superior in terms of critical thinking skills, whereas in terms of science process skills female students are superior, and in terms of digital literacy male students are superior. From the results of the interviews it was concluded that the three variables were categorized as good. It can be concluded that there is a significant influence between critical thinking skills and science process skills on digital literacy.

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