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Development of Digital Literacy Assessment Instruments in Physics Learning at MAN 5 Batanghari

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ABSTRACT

This research is motivated by the importance of students' digital literacy skills in the learning process. This research is a type of descriptive qualitative research, with the aim of knowing how the digital literacy assessment instrument was developed. The population of this study were students at MAN 5 Batangahari, from which the population was sampled using a purposive sampling technique, namely class X students at MAN 5 Batanghari who majored in MIPA, totaling 35. The data collection instrument used was structured interview sheets. for teachers and students. Then data analysis in this study used Miles and Huberman's analysis which consisted of data collection, data reduction, data presentation, and drawing conclusions. The result of this study is the need to develop a digital literacy assessment instrument that is in accordance with digital literacy indicators and learning objectives because there are not many assessment instruments available to measure digital literacy.

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Introduction

Education is one of the keys to the progress of a nation and state. According to Sudarmono et al., (2020) because education is the spearhead in order to improve the quality of human resources so that they are able to compete in the midst of competition in the life of an increasingly advanced and modern nation. Education is a conscious process carried out for students in order to grow and develop physically and spiritually optimally to reach a level of maturity (Ramdhani, 2017: Hasanah et al., 2022). Therefore education is important and there will be no end for individuals to develop themselves in order to live and sustain life (Alpian et al., 2019: Hamdani & Indriani, 2020). One of the ways in education to develop oneself is of course to learn. The lessons that can be learned are of course very many and varied for the level of high school (SMA) students, one of which is physics learning whose learning is science in nature.

Physics is one of the fields of science in the educational unit. Physics is learning that cannot be separated from mastering concepts, applying them to physics problems, and working scientifically (Huda et al., 2017: Puspitasari, 2019). Learning physics in high school

is a vehicle for students to learn about themselves and the environment (Nugrahani, 2018). However, learning physics in schools in general is still centralized on the material contained in books (Nana, 2022). Even though physics can be obtained anywhere, not only in school books owned by students. In obtaining and studying physics, students also need to have literacy skills to add insight so they are not fixated on reading only on books used for study at school.

Literacy is a skill that must be possessed by every student. The development of literacy is very important to pay attention to, because literacy is an initial ability that must be owned by every individual to live life in the future (Fitriani & Aziz, 2019). This literacy must be grown and developed in the school environment, which is called school literacy. According to Akbar, (2017) a culture of school literacy is necessary, in addition to improving the quality of learning, school literacy also aims to facilitate and develop students' abilities, get used to reading and manage the information they obtain, so that learning is more meaningful, quality and enjoyable. Along with the development and advancement of technology, literacy activities have shifted to become more modern and sophisticated, which is called digital literacy.

Digital literacy is defined as the ability to understand, analyze, assess, organize, evaluate information using digital technology (Asari et al., 2019). Digital literacy is as important as usual literacy activities such as reading, writing and arithmetic. However, according to Pradana, (2018) the generation that grows up with unlimited access to digital technology has a different mindset from the previous generation. Along with the development of technology, information and communication, students are required to master digital literacy (Rahmadi & Hayati, 2020). That way in learning at school the ability of students in digital literacy must be measured and known. Because with good digital literacy skills students can facilitate their learning process in obtaining information. A digital literacy assessment needs to be carried out by the teacher as an evaluation tool using an assessment instrument.

Based on interviews conducted with physics teachers at MAN 5 Batanghari, physics teachers have never assessed students' digital literacy skills, and teachers only focus on assessing their cognitive abilities or knowledge when learning physics. Teachers as educators also said that they had never made and knew how to use a good digital literacy assessment instrument to measure digital literacy skills. After knowing the facts based on the interviews and descriptions described above, it can be said that students' digital literacy abilities in physics learning are very important to make it easier for students to obtain information quickly and from various sources through digital media. However, this ability still needs to be measured using digital literacy assessment instruments that teachers do not yet have. So it is necessary to develop an assessment instrument to measure the digital literacy abilities of class X students at MAN 5 Batanghari.

Method

The method used in this research is descriptive qualitative method. According to Creswell, J.W in Rukin, (2021) qualitative research is research that is used to examine human and social problems, where researchers will report the results of the research based on reports of data views and data analysis obtained in the field, then described in a detailed research report . Descriptive qualitative can be interpreted as a research method that moves to a simple

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qualitative approach with an inductive flow, namely starting with an explanatory process or event which finally draws a conclusion (Yuliani, 2018). According to Gumilang, (2016) qualitative research has the main characteristics, namely: (1) data is not in the form of numbers, more in the form of narratives, descriptions, stories, written and unwritten documentation, (2) qualitative research does not have absolute formulas or rules for processing data and analyze data.

The population in this study were students at MAN 5 Batanghari. Where the sampling using purposive sampling technique. Purposive sampling is a non-random sampling method in which the researcher ensures the citation of illustrations through the method of determining a special identity that matches the researcher's goals so that it is expected to be able to respond to research problems (Lenaini, 2021: Mufarrikoh, 2020). By using a purposive sampling technique, the sample used in this study were students of MAN 5 Batangahri who were in class X majoring in MIPA, totaling 35 students and a class X physics teacher.

The data collection instrument used in this research was using teacher and student interview sheets. Where the interview used is a structured interview. This structured interview is an activity that has been designed and compiled by the researcher, in the form of a questionnaire or questionnaire containing questions related to obtaining research data directly (Rudini & Khasanah, 2022). Meanwhile, according to Subagyo, (2020) structured interviews are interview guidelines that are written and set forth on paper or writing as a guide for researchers in conducting interviews with informants and informants. Then the data analysis used refers to the concept of Miles and Huberman, namely data collection, data reduction, data presentation, and drawing conclusions. Data collection means the activity of collecting research data. Then data reduction is defined as the activity of selecting important and unimportant data from the data that has been collected. Presentation of data is defined as the presentation of structured information. Conclusion is interpreted as an interpretation or interpretation of the data presented (Miles & Huberman in Wijaya, 2020).

Results And Discussion

The following is a table of the results of interviews conducted by researchers with class X students majoring in MIPA and physics teachers in class X MAN 5 Batanghari. Identification the samples of participants major demographic characteristic for human, such as age; sex; ethnics and/or racial group; level of education; socioeconomic; generational, or immigrant status; disability status; sexual orientation; gender identity; and language preference as well as important topic-specific characteristic.

Table 1. Results of interviews with class X MAN 5 Batangahari students.

No	Question	Response
1	Does the school provide information technology facilities?	Yes, like a computer and wifi internet,
2	What are the information technology facilities provided by the school?	There are facilities available but they are less active in their use, usually only used during exams.
3	What learning resources do you often use when studying?	Print books available in schools and those used by teachers during lessons and *smartphones* .

4	Do you like learning to use information technology as a learning resource?	Yes, I really like it because it's more interesting.
5	Do you prefer to learn from book sources or from existing facilities in information technology? Why?	Prefer through information technology such as through *a smartphone* . Because apart from being more interesting, of course learning is fun by listening to and watching learning videos available on the internet.
6	How often do you use information technology as a learning resource?	Often enough.
7	What are the benefits that you get from learning to use information technology as a learning resource?	The benefit is knowing learning such as physics experiments that are not practiced in schools, but are known through digital media.
8	Have you ever used information technology to learn in class?	Occasionally, but very rarely, because schools are not allowed to carry smartphones unless instructed by the teacher.
9	Do you use information technology in the learning process such as laptops?	Yes.
10	How often do you use information technology in the learning process?	Often enough.
11	What lessons usually use computer digital media? Is physics lesson also included?	Yes, physics learning is included, sometimes teachers use laptops and projectors in classroom learning.

Table 2. Results of interviews with physics teachers for class X MAN 5 Batanghari

No	Question	Response
1	What media and technology are available in schools to support learning?	The available media is laptop, infocus and the screen is like that.
2	Are you able to apply the digital media and technology?	Yes, can use it.
3	What is the condition of students regarding literacy skills and digital literacy at school?	If at school the digital literacy ability is not very visible because at the school itself students are rarely allowed to carry and use smartphones, if using, maybe even a laptop during exams.
4	What are the obstacles that you are still facing related to the application of digital literacy as a learning support?	The problem is that usually if school assignments are notified through digital media such as whatsapp groups, not all of them have smartphones, and the problem is that facilities such as wifi networks are sometimes not strong enough to present interesting learning material all of a sudden.
5	Have you ever used digital media in carrying out your studies?	Yes, there have been times like laptops and infocus or projectors to display learning material whose application is difficult in life so that students feel it is more visual by displaying it using video etc.
6	How is student learning behavior when participating in learning using digital media?	Usually students are very enthusiastic and pay attention when learning is delivered with digital media.
7	Are there any obstacles in learning using digital media?	For problems using it, sometimes you need to take turns using the projector because there are not many items available.
8	In your opinion, what abilities are mastered by digital literacy?	With digital literacy, students certainly learn to distinguish which news or things are true and which are not, which is called filtering information,

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		then students learn to analyze the information they obtain from various sources, then the most important thing is that students know what they are looking for in the digital media. related to learning.
9	Have you ever measured students' digital literacy skills at school?	Never, just an observation.
10	If you have used what you measure this ability. If not, why?	Not yet because it seems that there are still many more important cognitive abilities to be measured related to students' physics learning.
11	Do you know about the assessment instruments used to measure students' digital literacy skills?	Yes I know.
12	Have you ever made or researched and used existing instruments that can be downloaded on the internet to measure students' digital literacy skills?	Have never downloaded and used digital literacy instruments that may be available on the internet, let alone made them. I think as educators sometimes they don't have the time to make instruments to measure digital literacy skills because it's still not considered urgent to measure these abilities.
13	Do you think the existence of an assessment instrument to measure students' digital literacy skills is important?	If seen and understood more deeply, it is actually important to have an assessment instrument to measure digital literacy skills, to make it easier for teachers to prepare the instruments so teachers can use them immediately.
1 4	If there is an assessment instrument to measure students' digital literacy according to the indicators, will you use it to measure students' digital literacy skills in this school?	Yes, of course if the available instruments are in accordance with the digital literacy indicators being measured and in accordance with the circumstances of the students, then it may be used.

The results of interviews conducted by researchers with class X students majoring in MIPA, students said that learning delivered using technology or digital media was more interesting and fun. Usually the teacher adds learning videos when learning is delivered using a projector and laptop. Then the students conveyed that learning at school is not allowed to carry and use smartphones. But of course students still use it at home to help and make it easier to do school work. In addition, by using digital media students can better understand and know learning material that is not taught in the form of physics practices or experiments. With the literacy skills possessed by students by using digital media, they can increase students' knowledge, apart from only focusing on printed books used in class.

Meanwhile, based on the results of interviews conducted by researchers with physics teachers in class X MAN 5 Batanghari, in delivering learning in class digital media that teachers usually use are laptops and projectors. As for the students themselves, they are not allowed to use and carry smartphones at school unless instructed by the teacher. Therefore literacy skills using digital media are not visible. Whereas knowledge and skills in the field of digital technology must be owned in order to be able to use information effectively in various forms, such as electronic publications, online videos, audio recordings, digital libraries, and databases (Nahdi & Jatisunda, 2020). If learning is delivered using digital media, students are usually more enthusiastic and pay more attention to the learning being conveyed than learning that is delivered manually without supporting technological media. However, the use of a tool in the form of a projector cannot be used every day because of the limited availability of these items in schools so that it becomes an obstacle in carrying out more effective learning.

Then the teacher also said that this digital literacy ability turned out to be important because students could learn to differentiate and filter information received through digital media, then students also learned to analyze information or answers to questions sought with various available sources. After realizing this, so far the teacher has never measured students' digital literacy skills in physics learning. Teachers think that there are still many more important cognitive abilities to be measured and assessed related to physics learning. For this reason, teachers never search the internet or make assessment instruments themselves to measure digital literacy skills. The teacher said that as educators the teacher did not have much time to prepare an assessment instrument himself, and if an assessment instrument was available that was in accordance with the indicators being measured, the teacher felt it was very easy with this instrument.

The assessment instrument for measuring digital literacy is very important considering that digital literacy skills must be owned by students. However, to be said to be digitally literate, students must have four digital literacy competencies put forward by Paul Gilster in Rodin & Nurrizqi, (2020), that is:

1. Searching the internet, which includes the ability to search for information on the internet using search engines, as well as the ability to perform various activities on it.
2. Guiding the direction of hypertext, which includes the ability to understand the characteristics of a web page, how the web works, and knowledge about hypertext and hyperlinks.
3. Evaluation of information content, namely the ability of a person to think critically and provide an assessment of what is found online accompanied by the ability to identify the validity and completeness of the information contained referenced by hypertext links.
4. Composition of knowledge, namely the ability to organize knowledge, build a collection of information obtained from various sources with the ability to collect and evaluate facts and opinions properly and without prejudice be

By having four digital literacy competencies, according to Gilster, new students can be said to have good digital literacy skills. For this reason, in an effort to determine students' digital literacy abilities, a measuring instrument or evaluation tool is needed in the form of a digital literacy assessment instrument. Assessment is an important aspect of the educational process (Setiadi, 2016). Meanwhile, the self-assessment instrument is something that must be present in the learning process as a tool used to obtain all information to objectively determine students' ability levels (Mudanta et al., 2020). The assessment domains contained in the 2013 curriculum and the Merdeka curriculum include the spiritual domain, social attitudes, knowledge and skills. For this reason, in the learning process, it is not only knowledge that must be measured, but others as well, such as the domain of skills by measuring students' digital literacy skills or abilities. According to Winarno in Aji & Winarno, (2016) an instrument is said to be good if it has criteria including having validity, reliability, and having practical value.

The developed digital literacy assessment instrument consists of several stages, namely conducting analysis, then product design, and the development stage. Product development in the form of a digital literacy assessment instrument needs to be carried out because there are rarely appropriate and accurate digital literacy assessment instruments to directly evaluate the realm of digital literacy skills in the field. Because there is still no digital literacy assessment instrument that is appropriate and can be used during learning, it is

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necessary to develop a good instrument. Determination of indicators is very important in the development of this instrument. After the indicators are determined, the indicators are developed and translated into learning objectives with digital literacy skills. To achieve the goal, it is necessary to make a grid of this digital literacy assessment instrument. The developed grid will become a benchmark in making statement items which will later be used as a tool to measure digital literacy abilities. Then after deciding to develop a grid and compiling statements, the next step is validating the product. The digital literacy assessment instrument that was developed was through a validation test with 3 experts which included material experts, construct experts, and linguists. After the validity test is carried out, the reliability test is carried out. If the results have not been proven valid and reliable, then the instrument is revised and refined. However, if the results are valid and reliable, the final step is a field test, namely a small group trial of the research sample, namely class X students majoring in Mathematics and Natural Sciences. The purpose of this field test is to confirm the results that the instrument can be used by teachers as a tool to measure students' digital literacy skills.

Conclusion

Based on the results of the research described above, it can be seen that the development of an assessment instrument to assist teachers in measuring students' digital literacy skills is very important. With an appropriate assessment instrument that can be used to evaluate physics learning, it will make it easier and very helpful for teachers to carry out these assessments with instruments that are already available and have proven validity and reliability. The digital literacy assessment instrument developed was tested for validity with 3 expert validators, namely material experts, construct experts and language experts. With the digital literacy ability assessment instrument, it can be well known and measured students' digital literacy abilities.

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