E-Assessment Of Student Perception Of Natural Sciences Based On Seska In Middle School Students In Indonesia

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Abstract: The study aims to apply e-assessment of students' perceptions of natural science subjects. In addition, the e-assessment of student perceptions in this study aims to see students 'perceptions of natural science subjects and how the teacher responds to the development of e-assessment of students' perceptions of natural science subjects using the "SESKA" system. The e-assessment of students' perceptions of natural science subjects makes it easier for teachers to assess how students perceive natural science subjects. This study uses a "SESKA" system based on MySQL applications. The sample used in this study was 516 students and 27 teachers. This research contributes to making it easier for teachers to assess the character of students' perceptions of natural science subjects. After a large group test, e-assessment of student perceptions of natural science subjects is feasible to use so that it can facilitate teachers and students in evaluating themselves. E-assessment of student perceptions of natural science found that students' perceptions were good with a percentage of 67.8% (350 students from 516 students). Then for the teacher's response to e-assessment students' perceptions of natural science are classified as good responses with a percentage of 77.8% (21 teachers from 27 teachers). At the practical level of e-assessment of students' perceptions of science subjects, the results can be beneficial for teachers and students in evaluating themselves. At the theoretical level, this study makes it easy for researchers to know how perceptions of natural science subjects. By entering the name, class, and origin of the student's school, then students click on the circle of their choice, so the researcher can immediately know the results. Understanding student perceptions of natural science subjects can improve student learning outcomes. This study was only conducted in 3 schools in Indonesia, precisely in Jambi province. This research should be extended to other provinces and abroad and use larger samples.

Index Terms: E-Assessment; Natural Science; Perception, MySQL; Students; Junior High School; ICT

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1. INTRODUCTION

Human resources (HR) have the most important role in the development of the advancement of science and technology. This fact shows that the development of human resources (HR) is a lot happening in the field of education following up on global progress and trends in teaching approaches [1]. Quality human resources are human resources who have the ability to compete in a healthy manner in various fields, including in the fields of science and technology. Education can support the development of each individual in mental, physical, emotional and social aspects, and help them to grow up independently and be able to live in harmony with society [2]. So the effort that can be made to improve the quality of human resources is education. Education moves every year from one development stage to the next by having different educational characteristics and challenges [3].The development of technology and information is now able to change the teaching process so that it is easier to achieve teaching goals [4]. The development of information and communication technology can be used to support and develop children's cognitive, affective and social skills [5]. At present the condition of education continues to experience a significant increase so assessment is needed. Assessment in the field of education is the most important thing, because it aims to be able to measure the extent of improvement in education [6]. Assessment is used to provide evaluations of the results of learning that have been done by students [7]. Current advances in information and communication technology have transformed the teaching and learning process towards a portable, student-centered and multi-platform environment [8]. Assessment can be an assessment of affective, cognitive, and psychomotor. Especially in affective assessment still requires attention because many educators who consider affective assessment are common. [9] stated that "Attitude is important determinants of be haviour. When instruction creat interest and enthusiasm, learning will be easier, more rapid, and result in higher achievement". Attitudes influence student behavior. A

positive attitude will influence behavior in a positive direction, whereas a negative attitude will lead to negative behavior. Attitude is often regarded as the personal trust of each individual who is stable and difficult to change [10]. Character evaluation is important to determine the behavior or attitudes of individuals who tend to be stable. Character is good objectivity that shows human quality, whether known to humans or not, and goodness is affirmed by society and religion [11]. Factors that cause good or bad affective students are from the character of students in learning. [12] describe One of the fundamental principles of social cognitive theory suggests that human beings have the ability to control their own behaviour. Character is the right object to be able to see the quality of human resources because character development is closely related to the development of student behavior. One of the characters that will be discussed is student perceptions. According to [13] perceptions formed by students can be either positive or negative perceptions. Students who have positive perceptions tend to accept the object that is captured according to their personality, while students who tend to reject the object they are capturing for their personality are students who have negative perceptions. If students 'perceptions of a lesson are good, then in learning students will be more eager to take lessons, but if students' perceptions of a lesson are not good then students will feel reluctant and even lazy to take lessons [14]. So that the assessment of students' perceptions plays an important role in achieving learning goals. The perceptual assessment of students in this study is specifically on science subjects. Science learning according to [15] the terms of natural sciences helps students studying in different fields of natural sciences; develop understanding and thinking the meanings of scientific terms and concepts. According to [16] science learning gives students the opportunity to describe objects and events, ask questions, gain knowledge, construct explanations of natural phenomena, test explanations in various ways and communicate them to others. Natural Sciences (IPA) relates to

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how to find the truth of a natural phenomenon in a systematic and coherent way through the process of discovery by the scientific method [17]. Based on these expressions, it can be concluded that science is a subject that studies systematically and coherently natural phenomena. In the form of animals, plants, and natural objects that are around us and in space through experiments and scientific studies. In addition, the existence of science learning will train students to be scientific, ie honest, objective, open, resilient, so as to be able to make science learning a meaningful subject in daily life. Character assessment of students' perceptions still uses conventional methods. Assessments that are often used are still conventional in contrast to the use of teaching materials that have had many developmental innovations [18]. Educators use instruments for perception assessment sheets. According to [19] "The researcher will have to judge the appropriateness of using a questionnaire for data collection, and, if so, what kind of questionnaire it will be". This can be obtained directly to students because of the assessment in the form of sheets of paper containing statements describing students' perceptions of science learning. As a result, the time spent learning becomes excluded to fill perception assessment questionnaire instruments. Not only are there a lot of assessment sheets, the costs will also increase. So the use of conventional perception-based assessments has many disadvantages. The development of the 4.0 industrial revolution should educators and educational institutions should follow the development of revolution 4.0. The industrial revolution 4.0 has the characteristics of using learning based on internet networks and technology. This development will be a solution in developing student learning, one of which is the use of e-learning [20]. The development of industrial revolution 4.0 should educators and educational institutions follow the development of revolution 4.0. The industrial revolution 4.0 has the characteristics of using learning based on internet networks and technology. The use of e-learning has a very positive impact on student enthusiasm. E-learning is the most recent way to carry out distance education by distributing learning materials and processes over the Internet [21]. So that as an other support, electronic-based assessment is needed as e-assessment. According to [22] the use of e-assessment can streamline time, funding and convenience to fulfill the assessment process. The use of e-assessment can not only be used by teachers who act as evaluators, but students can also use e-assessment to minimize the level of fraud in processing data [23]. The development of industry revolution 4.0 in education is one of them is an e-assessment program, namely "SESKA". The use of SESKA as a program to assess the character of students' perceptions of science subjects and make the assessment system more effective. So that the teacher does not bother anymore to double the paper to do the assessment process.

Figure 1. *Homepage Website SESKA (Welcome On Website Seska)*

The picture above shows 3 main menus, namely: Home, Physics, Science. SESKA system for E-Assessment. Based on the description that has been described, the problems that will be discussed in this study are:

1. How is the perception perception of students towards science using E-Assessment using a "SESKA" system program?
2. What is the teacher's response to the development of character assessment of the perception of science using the "SESKA" system?

2 METHODOLOGY

2.1 Research Design
There are 3 stages of research in this study, namely (1) Development, (2) Implementation, (3) Evaluation. The following are the research stages:

1. Development
   At this stage the development of an Assessment Assessment questionnaire of student perceptions of natural science was carried out. In the development phase, the instructor was to construct and deliver materials required for the sessions (Wang & Hsu, 2009). Questionnaire statements are prepared based on indicators measuring student perceptions of natural science. Students' perceptions of natural science have 3 indicators, namely: (1) observation of the discipline of natural science teachers, natural sciences and media material, (2) understanding of the way natural science teachers teach, natural science materials and media, (3) assessment of the way natural science teachers teach, natural science material, media, and facilities. The next step is making and developing e-assessment based on flowcharts and storyboards, as well as analyzing the needs of hardware and software. Then input the e-assessment of perceptions of natural science in the "SESKA" system. SESKA is the name of the system that uses the MySQL application.

2. Implementation
   The initial step of the implementation phase is a trial of a small group of e-assessment of student perceptions of natural science. Small group trials to determine students 'assessment of student perceptions of e-assessment and concluded that e-

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assessment of students' perceptions of natural science through a "SESKA" system is feasible. Then a large group trial was conducted. This large-scale trial is the implementation stage of software development carried out, This implementation involves prospective users, namely educators and students [24]. The assessment of students' perceptions of natural science through the "SESKA" system was carried out for 516 students. While the teacher's response to e-assessment of student perceptions of natural science was carried out to 27 teachers.

3. Evaluation
This stage is the overall evaluation phase of e-assessment of students' perceptions of natural science using the "SESKA" system. This stage is the last step before e-assessment of students' perceptions of natural science is feasible to use for larger samples and larger areas. The purpose of the evaluation phase is to improve the weaknesses of e-assessment using the "SESKA" system so that e-assessment is feasible. Perception assessment using the "SESKA" system is used to connect designers and users directly in assessing student perceptions of natural science.

2.2 Research Sample
The research sample uses a sampling technique that is purposive sampling. In purposive sampling, researchers selected cases themselves to be included in the sample based on their assessment of their typicality [19]. The sampling criteria are students who have high, medium and low values of natural science. The sample in this study amounted to 543 people with details of 27 teachers and 516 students.

3 RESULTS AND DISCUSSION
The most important thing that must be considered by schools to achieve the goals of education is not only focused on the cognitive, but the assessment of attitudes is also important to do. Given the positive or negative attitude of students towards science will greatly affect their educational background [25]. Especially the assessment of students' perceptions of science subjects will provide assistance to educators to measure how students perceive natural science subjects so that they support improving student learning outcomes. According to [26] affective measurement of science/science is considered important because it can affect the performance of students and can improve student learning achievement. Sources of data obtained during this research are sourced from affective E-Assessment on perceptual characters using "SESKA" programming, students and teachers fill out E-Assessment as respondents. The filled in data will be input automatically in the "SESKA" programming. The acquisition of the data generated is quantitative data in this study, to see how the percentage of statistical perceptions of science subjects will be analyzed using SPSS Statistics 25 programming..So that the development of technology, computational based assessment is very efficient in using schools to measure student perceptions. Computing has an important role in exploring science and solving scientific problems [27]. Database system E-Assessment of student perceptions of science subjects with a "SESKA" system using the MySQL database. database server MySQL is a program that can store large amounts of information in anorganized format that's easily accessible through programming languages like PHP [28]. The existence of this MySQL database makes assessment more efficient. The following are the results obtained from the "SESKA" programming.Student Perception E-Assessment of Natural SciencesThe results of e-assessment of students' perceptions of natural science can be seen in table 1.

Table 1. E-Assessment Of Students' Perceptions Of Natural Science

Interval	Category	Total	Percent	Standard Deviation	Mean	Modus	Median	Min	Max
22,0-39,6	Very Bad	0	0%						
39,7-57,2	Bad	2	0,4%						
57,3-74,8	Pretty Good	52	10,1%	9,14	84,54	86	86	49	109
74,9-92,4	Good	350	67,8%						
92,5-110,0	Very Good	112	21,7%						

Based on the table above as many as 0 students categorized as very bad with a percentage of 0%, 2 students categorized as not good with a percentage of 0.4%, 52 students categorized quite well with a percentage of 10.1%, 350 students categorized well with a percentage of 67.8%, and 112 students were categorized very well with a percentage of 21.7%. So it can be concluded that students tend to have good perceptions of natural science.

a. Teacher's Response to Student Perception E-Assessment of Natural Sciences
The results of the teacher's response to e-assessment of students' perceptions of natural science can be seen in table 2.

Table 2. Teacher's Response to Student Perception E-Assessment of Natural Sciences

Interval	Category	Total	Percent	Standard Deviation	Mean	Modus	Median	Min	Max
15,0-27,0	Very Bad	0	0%	6,57	57,44	54	56	40	72
27,1-39,0	Bad	0	0%						
39,1-51,0	Pretty Good	3	11,1%						
51,1-63,0	Good	21	77,8%						
63,1-75,0	Very Good	3	11,1%						

Based on the above table there are 0 teachers categorized as very bad with a percentage of 0%, 0 teachers categorized as not good with a percentage of 0%, 3 teachers categorized quite well with a percentage of 11.1%, 21 teachers categorized both with 77.8%, and 3 teachers are categorized very well with a percentage of 11.1%. So it can be concluded that the teacher's response to student perceptions of natural science belongs to the good category.

b.   Perception Character E-Assessment of "SESKA" science-based subjects

The E-Assessment was developed aiming to make the time and educators efficient in providing student assessments. In addition, the E-Assessment that will be made later aims to see the behavior and character of students, especially how students perceive science subjects. This behavioral assessment is important to do because behavior has a relationship with learning outcomes and individual students. Self-concept is assumed to be a very important and influential factor related to a person's behavior and emotions and cognitive outcomes, such as student academic achievement [29]. One programming that will facilitate this assessment is "SESKA".The SESKA system uses program language created on Macromedia Dreamweaver MX 2004 applications in the form of PHP. Using PHP uses a scripting language that embeds HTML from web pages. In order for the score to be stored in the database, a PHP script is needed to save the score to the MySQL database on the server [5]. SESKA uses MySQL as one of the database input servers that aims to store E-Assessment information. According to [5] MySQL is one server to input data base. MySQL in the SESKA E-Assessment program will make the data filled in by respondents will enter the information database continuously. As stated by Bulger (2004) MySQL and other relational databases are multi-threaded, which means that they can process directives from multiple clients simultaneously. So that it can facilitate the assessment process. When evaluators want to return to the destination, the web server executes the PHP script and replaces the results back to the page [31]. Thus the results of measuring the character of students' perceptions of science subjects can be seen based on the image below:

Figure 2. *Home Page E-Assessment Students' perceptions of science subjects use "SESKA" programming*

Based on the picture that has been obtained, it can be seen what the SESKA programming page looks like. Figure 1.2 is a picture of the start page that the respondent will see when opening the program before filling out the E-Assessment of students' perceptions of science subjects. Respondents when opening the crew page will show photos of students who are discussing. Furthermore, at the top of the photo, the text says "Welcome to the SESKA Website". At the top left side there is a SESKA programming menu, there are 3 sub-menus, namely homepage, PHYSICS, and IPA. Students' responses when completing the E-Assessment using the "SESKA" programming show a positive expression. This is caused because it looks more attractive so it makes students more familiar with the development of technology E-Assessment that is made. Because this researcher specializes in evaluating junior high school students, we will enter the IPA menu, which will appear as shown below :

Figure 3. *Display of student character menus in "SESKA" programming*

Based on the catch on the next layer when the respondent successfully enters the IPA sub menu, the display will appear as shown in 1.3. Seen there are many choices of character menus that will be measured. In this study researchers will measure the character of student perceptions. So that in this menu the respondent clicks on the perception menu, then the questionnaire will display students' perceptions of science subjects as shown below:
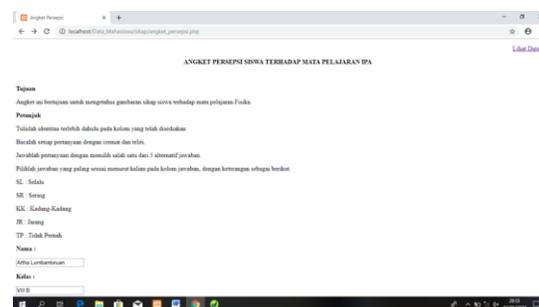

Figure 4. *The beginning of the E-Assessment of students' perceptions of science in "SESKA" programming*

Figure 5. *Section contents of E-Assessment of students' perceptions of science in "SESKA" programming*

The picture above is the display of E-Assessment of students' perceptions of science. When the display of students' perceptions of the science subject is open, the respondent will fill in the identity of the respondent. Not the same as usually the instrument displayed will be more efficient, so as to minimize errors in filling the instrument. The development of E-Assessment character of student perceptions of science "Papper" transformed into E-Assessment with programming language (coding). Because in general the existing questionnaires still use conventional and manual methods, and there are many weaknesses in the assessment side. Since manual systems can slow down, take a long time, boring and the manual method is troublesome for every individual [5]. In addition, the data that has been filled in by the respondents will be input automatically so that the researchers are not too difficult to input the questionnaire results that have been obtained from the respondents.

Figure 6. *The results of filling in the questionnaire of students' perceptions of science in "SESKA" programming*
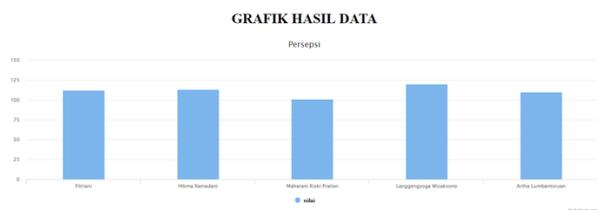

Figure 7. *Graph data on student perceptions of science in "SESKA" programming*

Figure 6 and Figure 7 are the results of the data that have been filled in by the respondents. Figure 6 shows the results of respondents' answers to student perceptions questionnaire instruments. The table shows the data of respondents in class

VIII A and VIII B of State Middle School 6, State Middle School 5, State Junior High School 26 of Muaro Jambi. Next in Figure 7 shows a graph of data on student perceptions of science subjects. The table and graph above are the results of data that have been processed using "SESKA" programming. So that it is proven that the "SESKA" programming can help researchers in collecting research data.

4 CONCLUSION

Based on the results of e-assessment research on students 'perceptions of science to 516 students, the results showed that students' perceptions were good with a percentage of 67.8% (350 students). Then for the teacher's response to e-assessment students' perceptions of natural science are classified as good responses with a percentage of 77.8% (21 teachers from 27 teachers). So it can be concluded that e-assessment of students' perceptions of natural science using a "SESKA" system is feasible to use so that it can facilitate teachers and students in evaluating themselves.

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