

ICT-Based Authentic Assessment System Development to Measure Students' Responsibility, Cognitive, and Teamwork Skill

Hafid Setiyadi^{1✉}, Wiwi Isnaeni², Ellianawati Ellianawati²

¹. SDN 3 Depok, Kec. Toroh, Kab. Grobogan, Jawa Tengah, Indonesia

². Pascasarjana, Universitas Negeri Semarang, Indonesia

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Abstract

The authentic assessment is a teacher's challenge. The cognitive aspect is central of the continuity in learning development because authentic assessment is considered complicated to implement. The aim of the research is to produce an authentic ICT-based assessment system that is feasible and effective. The research method uses a one group pretest-posttest design with data collection techniques in the form of observation, interviews, questionnaires, documentation, and tests for 131 fifth grade students with type of development is ADDIE stages. The tools that have been developed are validated and revised according to the suggestions of the media and material validators which are then tested with subjects outside the large group sample before applied in the large group test. The validation results show that the validity of the material is 95.83% and the validity of the media is 97.5% with very decent criteria, observation analysis of responsibility attitude is 88% and cooperation skills 93% with very good criteria. The large group test analysis on the pretest-posttest measures critical thinking skills as part of cognitive which shows the percentage of completeness (KKM>75) of 85% with an N-Gain score of 0.68 in the medium category and received criteria quite effective. Based on the results, it is concluded that an authentic ICT-based assessment instrument is feasible and effective to use to measure the cognitive competence, attitude of responsibility, and cooperation of fifth graders. The application of ICT-based authentic assessment system can measure students' achievement accurately. ICT-base authentic assessment system developed can be used with flexible in line with the needs of teachers.

✉ Correspondence address:
Jln. Kapten Rusdiat RT 06/RW 01, Kel. Danyang, Kec. Purwodadi
E-mail: hafidsetiyadi@gmail.com

INTRODUCTION

The quality of education is a challenge in the 21st century and teachers must be able to innovate and utilize information and communication technology in order to create human resources who have the skills to respond to the times. Therefore, the education system must undergo changes so that students are equipped to adapt to the times (Ongardwanich, Kanjawasee, Tuipae, 2015). Students need to be prepared to have the ability to learn and have skills, so that the learning held must be able to produce human resources who are literate with information, data, and technology (Hapsari & Nurcahyanto, 2015; Priyanti, 2019).

21st century learning skills have four categories: Creativity Thinking and Innovation, Critical Thinking and Problem Solving, Communication, in which Collaboration becomes the working system. Collaboration in learning implemented in the form of communicating and teamwork (Prayogi & Aesthetics, 2019). Teamwork is one of the activities that must appear in every lesson plan in 21st century learning. Teamwork in small groups learning in the classroom having an impact on students can learn and remember the teaching content much more (Septikasari, 2018).

Responsibility also plays a role in 21st century learning. Based on information from the Assessment and Teaching of 21 Century Skills, personal and social responsibility is one of four categories that must be developed as 21st century skills (Saavedra & Opfer in Redhana, 2019). Responsibility required because of a precautionary measure in the hope will improve student personal qualities because independently student will be responsible for the study and the expectation will improve the ability of student career. Responsibilities are also needed by students in learning, in order to increase the speed in receiving material which will certainly affect the target on the objectives, implementation, or reflection of learning that has been planned by educators previously (English & Kitsantas in Rochmawati & Ridlo, 2019). Responsibility on students can be seen when students solve

problems in learning so indirectly develop moral and will also improved the skills of reasoning that useful in future (Kinena, 2014). The aspect of teamwork and responsibility required in the implementation of related and learning by students, because in teamwork necessary responsibilities as a form of independence in completing tasks that are divided into groups.

Observation in the 5 grade Sendangmulyo 04 public elementary schools, it appears that responsibility and teamwork have not been fully implemented in ongoing learning. Found that teamworking of students in a group less serious and less liable for their duties to a charged the head of the group to members. This preliminary observations are supported by the findings of data from research by Ningrum, Slameto and Widyanti (2018) in the learning carried out in the classroom only a few students do group assignments and others seem less focused on following the lesson. It is also observed that students tend to be irresponsible in doing the tasks given in groups. This finding is also similar to the initial data finding in the research conducted by Syafitri (2017) that students are not responsible when carrying out teamwork in groups so that they get unsatisfactory results.

The results of observations from the teacher's aspect are still found with the fact that there is a tendency to prioritize cognitive aspects when carrying out assessments. In studies conducted by Ningrum, Slameto and Widyanti (2018) and Syafitri (2017), learning and assessment by teachers focus more on aspects of knowledge. This results in students becoming less responsible, less able to work together, and there is no good collaboration between teachers and students.

Good assessment will be impacted directly on the quality of learning. The system of right assessment and comprehensive will produce the meaning and effectiveness of learning (Ermawati & Hidayat, 2017). Authentic assessment can comprehensively measure student achievement in learning. To be able to measure authentic assessments accurately, an online-based assessment is needed (Hasanah, Edwita, and Januar, 2020).

The use of ICT-based assessments also has the advantage of being able to conduct assessments in the form of multiple-choice tests and or descriptions as well as being able to analyze student scores correctly (Marina, 2016). The application of ICT in assessment in elementary schools in the teaching and learning process is effective in encouraging better performance in the implementation of assessments (Oddershede, Donoso, Farias and Jarufe, 2015). This is in line with research from Firdaus, Isnaeni, and Ellianawati (2018) that interactive learning through smartphones which is a form of ICT media, find out of 59 students at SDN 1 Kalikoa there are 88% of students who use smartphones with internet connections, this is a capital and the potential for educators to be able to increase students' learning motivation and also their learning outcomes. The use of ICT create motivation in learning because it could create interactions among students and can reduce boredom in the evaluation of students (Dewi, Nugroho and Sulhadi, 2015; Salsabila, Habiba, Amanah, Istiqomah and Difany, 2020). ICT media is not only a teaching aid but also an inseparable part in the implementation of learning today (Agustien, Umamah and Sumarno, 2018).

Taking into account the descriptions of various research references that have been carried out previously by previous researchers, the researchers decided to develop an ICT-based authentic assessment system to measure the appropriate and effective responsibility, cognitive, and cooperation of fifth graders. The aims of this research are (1) to analyze the characteristics of authentic assessment instruments; (2) analyze the feasibility of the ICT-based authentic assessment instrument developed in the learning, and (3) Analyze the effectiveness of the ICT-based authentic assessment instrument in the Learning of the Environmental Theme of Sahabat Kita in measuring the attitude of responsibility, responsibility, cognitive competence, and cooperation skills of students in Class V Elementary School Gugus Bawana Ageng Semarang City. The benefit of this research is that it is able to improve the quality

and efficiency of learning, especially in the assessment of learning Theme 8. The Environment of Our Friends as well as being an alternative to using technology to optimize the authentic assessment process in the 2013 Curriculum.

METHODS

This research and development uses the ADDIE model by Lee and Owens with the basis that the product developed is a combination of technology (multimedia) devices, namely Android-based smartphones and websites. The phases of development in the model are arranged systematically because the development is carried out sequentially and continuously. Analysis is the initial stage of development which consists of a needs assessment and a front-end analysis. The needs assessment in the study was carried out by conducting interviews with teachers and classroom observations on learning as well as the availability of personal technology facilities. Second activities in the phase of analysis done with front-end analysis or can be called with analysis development needs. The second activities implemented with by analyzing the product development needs in accordance with the characteristics of student in grade V elementary school.

The design stage is the second stage in development research. Scheduling of product development of ICT-based authentic assessment instruments, creation of a product development team, and design of product specifications to be developed. The step in designing product specifications begins with an initial questionnaire analysis from teachers and students which is then designed in the form of a flowchart in the form of a program flow for the application of authentic assessment instruments. The development continued to design wireframe or a rough view of the program for the purpose of develop menu button order, sentence, and feature on the application. The design also developed a device that is required in the implementation of the product as an instrument supporting the needs of expert validation.

The third stage or called development stage is developmental stage of product with implementation of the final product. The stage of development started by making the appearance of wireframe become clear in the form of a storyboard. Development stage ends with do validation of media experts with the media created is eligible and as a prerequisite for carrying out product trials in small groups.

The implementation stage is the fourth stage in model of ADDIE consisting of small group or limited group trial and the implementation of the product that has been developed. The small group will produce pretest-posttest data with end to identify effectiveness of the ICT-based authentic assessment instrument product developed based on the N-Gain Score. Meanwhile in the implementation of the large groups in research using samples have been set at the earlier phase consisting of 131 student and 4 teacher. In addition to applying the application of ICT-based authentic assessment that has been developed, in the test was also filling out a response questionnaire to teachers and students as supporters in the product feasibility assessment at the end of learning.

The final phases in the model ADDIE is evaluation. The evaluation of the research is by applying an assessment of products based on the responses and data analysis in a large groups. Data analysis was carried out using quantitative

and qualitative techniques. Quantitative that is with normality, homogeneity, validity, reliability, N-gain and t-test to determine the effectiveness of the developed product so as to determine whether the hypothesis is accepted or rejected. On qualitative analysis done by processing interviews, the survey response teacher and students and described to support the needs of media development and also feasibility of ICT-based assessment that are in accordance with the characteristics of learning in cluster of Bawana Ageng. Product feasibility analysis is carried out using data validation results by media and material experts which are described by the following feasibility data analysis formula:

$$P = \frac{F}{N} \times 100\%$$

Description:

P: Percentage figures

F: Score obtained

N: Final score

The percentage obtained is converted into product eligibility criteria based on the percentage obtained from the validator, with the aim of knowing the level of feasibility of the developed media. The following are the product eligibility criteria against the final percentage obtained from media and material expert validators which are described in Table 1. regarding the product eligibility criteria.

Table 1. Product Eligibility Criteria

| Percentage (%) | Criteria |
|----------------|---------------|
| 90 – 100 | Very Worth |
| 80 – 89 | Worth |
| 70 – 79 | Fairly Decent |
| 60 – 69 | Less Eligible |
| < 59 | Not Eligible |

The final interpretation of the values obtained from the media expert valuator and the

material is then presented in Table 2 regarding the criteria for the expert validation assessment.

Table 2. The Experts' Validation Assessment Criteria

| Media Score | Material | Criteria |
|----------------|-------------|------------------------------|
| 17 < P < 20 | 30 < P < 36 | Very good, without revision |
| 14 < P < 16 | 23 < P < 29 | Good, with Slight revision |
| 10 < P < 13 | 16 < P < 22 | Adequate, with many revision |
| 5 < P < 9 | 9 < P < 15 | Less, cannot be used |

In product trials or limited group tests, pretest and posttest data were calculated by calculating the N-Gain Score using data on cognitive learning outcomes, which were first tested for normality and homogeneity using SPSS 25. Attitude and performance assessment used quantitative descriptive analysis. In addition to the teacher and student response questionnaires,

the scores obtained from the responses will be presented as a percentage and categorized as product criteria. The following is the response criteria of teachers and students who tested the hypothesis using t-test. From the results of the analysis of the percentage of the questionnaire presented in Table 3.

Table 3 Product Criteria from Teacher's and Student's Response

| Score (%) | Criteria |
|-----------|------------|
| 90 – 100 | Very good |
| 80 – 89 | Good |
| 70 – 79 | Adequate |
| 60 – 69 | Quite Good |
| < 59 | Not Good |

RESULTS AND DISCUSSION

The ICT-based Authentic assessment system was developed and packaged in two main products, namely the Website-based and Android-based Authentic Assessment System which is useful for separating teacher and student users. In addition, the separation of the two systems is based on the management of input and output from the system itself and avoids excessive crashes as well as ease of improvement in the development of an ICT-based authentic assessment application system. The use of the Android system is also based on its popularity in the present and becomes a learning support for students. The following describes the stages of research on developing an authentic ICT-based assessment instrument.

Analysis

Product development needs questionnaires were distributed to teachers and students to be

filled in, then analyzed, so that the appropriate characteristics of the system development to be carried out could be identified. Questionnaires were distributed to 4 fifth grade teachers at the Gugus Bawana Ageng Elementary School consisting of two teachers each from SDN Sendangmulyo 04 and SD Islam Tunas Harapan. It was found that the development of an ICT-based authentic assessment system uses the form of multiple choice test questions with questions that are able to improve students' critical thinking skills, and use automatic scoring (Supianti, 2018). The teacher needs questionnaire also shows that there is a need for an online-based assessment system and provides an account security system in the form of a login system for each user.

Furthermore, in the student needs questionnaire, it was distributed to 60 Grade Five students with 15 students taken from each class, each of which was taken 2 classes at SDN Sendangmulyo 04 and SD Islam Tunas Harapan. The results of the questionnaire recapitulation

show that the colors used in ICT applications must use bright colors. In addition, the teacher's questionnaire obtaining results also requires a login system in the application.

Design

The design phase of the ICT-based Authentic Assessment System was made based on the results of a questionnaire on the needs of teachers and students. At this stage, a flowchart is made with the aim that the system will run on the program, which is continued by designing a wireframe, namely a design that contains the

composition, structure, layout, navigation and content on each program interface. In addition, authentic assessment instruments were also prepared by conducting an analysis of Core Competencies (KI), Basic Competencies (KD), indicators, goals, and material on the theme 8 of our friend environment based on 21st century skills assessment. The elements in learning are arranged in the Syllabus and revealed in the Lesson Plan. The mapping of the authentic assessment of Grade Five Theme Eight Neighborhoods of Our Friends is presented in Table 4. below:

Table 4. The Mapping of ICT-Based Authentic Assessments on Theme of Our Friendly Environment

| Main Competencies | Basic Competencies | Form | Technique | Instrument | Process | Results |
|-------------------|--|----------|----------------------------|---|---------|---------|
| Attitude | Gratitude Honest Discipline Self-confident Responsibilities | non-test | Attitude Observation | The Attitude Sheet Observation by Using Assessment Rubric | √ | √ |
| Knowledge | Indonesian Language Sains (IPA) Arts (SBdP) Critical Thinking | test | Written Test | The Test Sheet in the Form of Multiple Choice Reasoned | - | √ |
| Skill | Indonesian Language Sains (IPA) Arts (SBdP) Teamwork ICT literacy | non-tes | Performance Observation | The Observation Sheet with Rubrics' Scoring | √ | √ |

Development

At the development stage, the designs that have been made in the form of wireframes are implemented into the first version of an authentic ICT-based assessment system application product or website and android-based alpha. In addition, the implementation of an ICT-based authentic assessment application

guidebook was also made to make it easier to use. The following is a display of the implementation of the ICT-based authentic assessment system product consisting of a website and android as well as a book on the use of an ICT-based authentic assessment application which is presented in Figure 1.

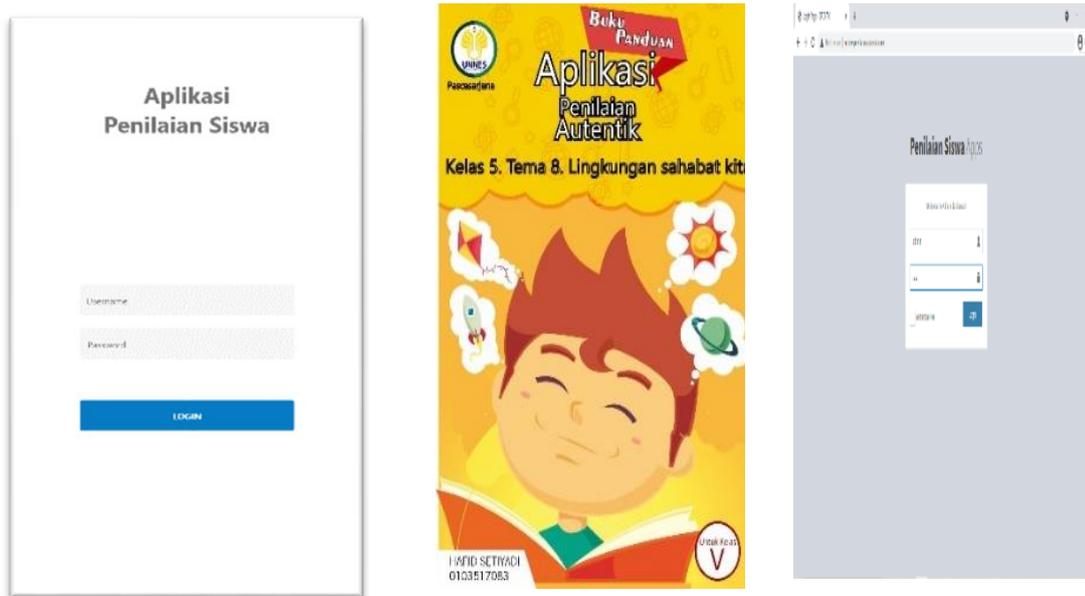


Figure 1. The opening view of web-based application system, android, and application usage guide book

The implementation of product consisting of android and website based on considering ease and care a system by developer. In addition, the developed divided into two parts because condition device of students who have low specifications. On the website used only teachers in the stage of preparing and planning of learning by applying input the assessment instrument. Website designed made flexible for the purpose ease in input, fix, and remove an instrument adjust needs teachers. On the android application only used in the process and end of learning either by teachers and students. Teachers use the application for the learning process on to assess student learning outcomes on the attitudes and psychomotor skills. At the end of learning, the android application used students to implement the evaluation of the learning have been implemented.

The products that have been developed are validated on the products that have been

developed. Validation was carried out on two aspects, namely media and material, each of which was validated by two validators. The media aspect is validated by two media expert lecturers who are Information Systems lecturers. While on the material aspect, validation was carried out by two educational practitioners. The results of media validation and interpreted in Table 1 with a final percentage of 97.5% with very feasible criteria, while on material expert validation the final percentage was 95.83% with very feasible criteria. Based on the validation results from media experts and the material for an authentic ICT-based assessment system that has been developed, it is worth testing it with revisions according to suggestions and comments from experts. The following is an initial view of the results of improvements from media and material experts presented in Figure 2.



Figure 2. The Opening View of an Android-based application system and guidebook after revisions by media and material experts

Implementation

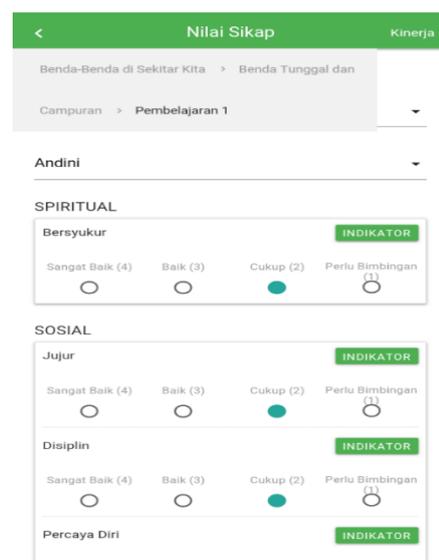
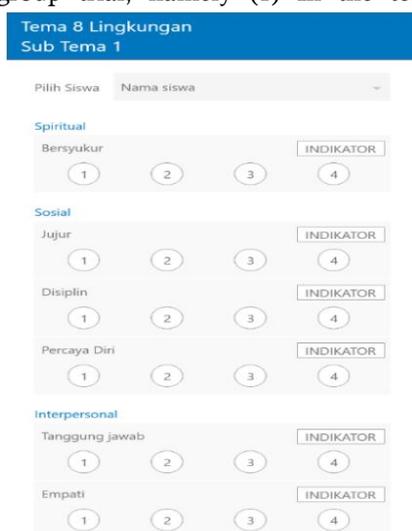
At the implementation stage, after the product was revised, it was then tested in small or limited groups consisting of 26 students and 1 class V teacher outside the large group or product implementation group.

From the small group trial, the effective results were obtained with an N-Gain Score of 0.71 in the high category and the percentage criteria were quite effective. Meanwhile, the response of teachers and students to an authentic ICT-based assessment system has very good criteria, namely getting a percentage score of 88% for teacher responses and 94% for students.

In addition, there were revisions after the small group trial, namely (1) In the teacher

application, pop-up indicators and score ranges did not appear so revisions had to be made. In addition to the student application, there is a system error, namely in multiple choice reasoned the reason column that should be filled in but is allowed not to fill in because there is a system error. (2) Scanning the QR-Code on the cover to download the application is still difficult to scan, therefore a large print is needed to facilitate the steps for installing the application for students (Muharom & Sholeh, 2016).

The following is an application improvement display which is a reflection on small group trials or limited trials presented in Figure 3.



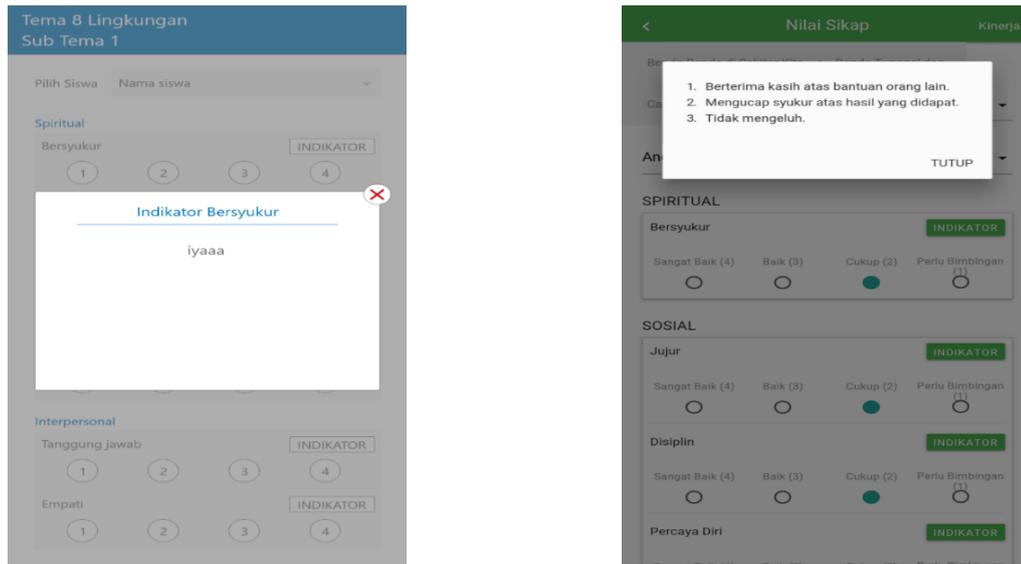


Figure 3. Revision of the Rubric Display and Application Indicators

After the revision of the small group trial, proceed to the large group test or product implementation. The following data analyzes the effectiveness of the use of an authentic ICT-based assessment system which is divided into assessments on cognitive aspects, responsibility, and cooperation in large group trials. Large group trials were carried out in one theme consisting of sub-theme 1 to sub-theme 3. The following is an analysis of students' cognitive improvement, collaboration skills, and student responsibility.

Cognitive Competency Analysis

Table 5. Obtaining the Pretest-Posttest of Students' Critical Thinking

| Data | Mean | Category | N-Gain |
|----------|-------|----------|--------|
| Pretest | 46.04 | Medium | 0.68 |
| Posttest | 83.89 | | |

Based on the analysis in Table 5, the effectiveness of increasing critical thinking skills which is one of the 21st century skills in cognitive competence and also increasing students' conceptual understanding with a significant increase and obtaining the medium N-Gain category and the percentage of N-Gain Score obtaining quite effective criteria .

Next, there is a t-test, a hypothesis test is carried out using a t-test using the Paired Samples Test formula with the help of SPSS 25, and the t-

Students' cognitive learning outcomes in the form of pretests that have not used ICT and posttests that have been carried out using an ICT-based authentic assessment system were analyzed to determine the effectiveness of using an ICT-based authentic assessment system using the N-Gain Score. Before calculating the N-Gain Score, the data for normality and homogeneity have been obtained with each being 0.066 in the pretest, 0.064 in the posttest and 0.229 in the homogeneity test. The results of the N-Gain Score are presented in Table 5.

value is 29,049 with $p = 0.000 < 0.05$ with H_a accepted and H_o rejected, which means there is an increase in thinking ability. critical thinking and conceptual understanding which are 21st century cognitive competencies. The use of ICT to improve critical thinking skills also has an effect on increasing ICT literacy which is also a skill in 21st century cognitive competence (Effendi, Bustanur, Mailani, 2019). It is proven in a large group test to produce posttest scores after the use of ICT, ICT Literacy with indicators (1)

Connecting digital devices to the internet, (2) using digital devices for learning, and (3) using digital devices according to the rules (Binkley, Erstad, Herman, Raizen, Ripley, Ricci, and Rumble, 2010; Fisser & Thijs, 2015), got an average of 94 which is included in the very good category. This result is supported by a similar development research from Aulia, Rusilowati, and Wahyudin (2019) that the use of ICT in learning also increases students' ICT literacy skills or digital literacy, namely information literacy, computer literacy, and internet literacy.

In addition to analyzing cognitive competence, it is necessary to analyze students' cooperative skills.

Student Teamwork Skills Analysis

There are 3 main indicators in the assessment of student collaboration skills in the ICT-based authentic assessment instrument program. The following is a description of the indicators on cooperation skills presented in Table 6.

Table 6. Analysis Results of Students' Teamwork Skills

| Indicators | Final Score | | | Mean | Criteria |
|--|-------------|-----|-----|------|----------|
| | ST1 | ST2 | ST3 | | |
| Actively participate in group activities | 90 | 91 | 95 | 92 | Good |
| Really do the job according to the agreement | 84 | 92 | 96 | 91 | Good |
| Helping a group of friends who are having difficulties | 84 | 90 | 97 | 90 | Good |
| Mean | 92 | 91 | 90 | 91 | Good |

Based on the results of the analysis of Cooperation skills in Table 6, it appears that there is a significant increase in students' cooperation skills in each sub-theme from 1 to 3, especially the second indicator by obtaining a final average on the cooperation indicator of 91 with a skill score on the rubric of 93 with criteria very good assessment with an A predicate. This indicates

that the use of ICT has a good impact on the creation of commitment in the group to complete the tasks that have been given with the motivation of favorites for the devices used in student learning (Myers, Blackman, Andersen, Hay and Lee, 2014). Figure 4 is a display of cooperation skills assessment on an Android-based authentic assessment application.

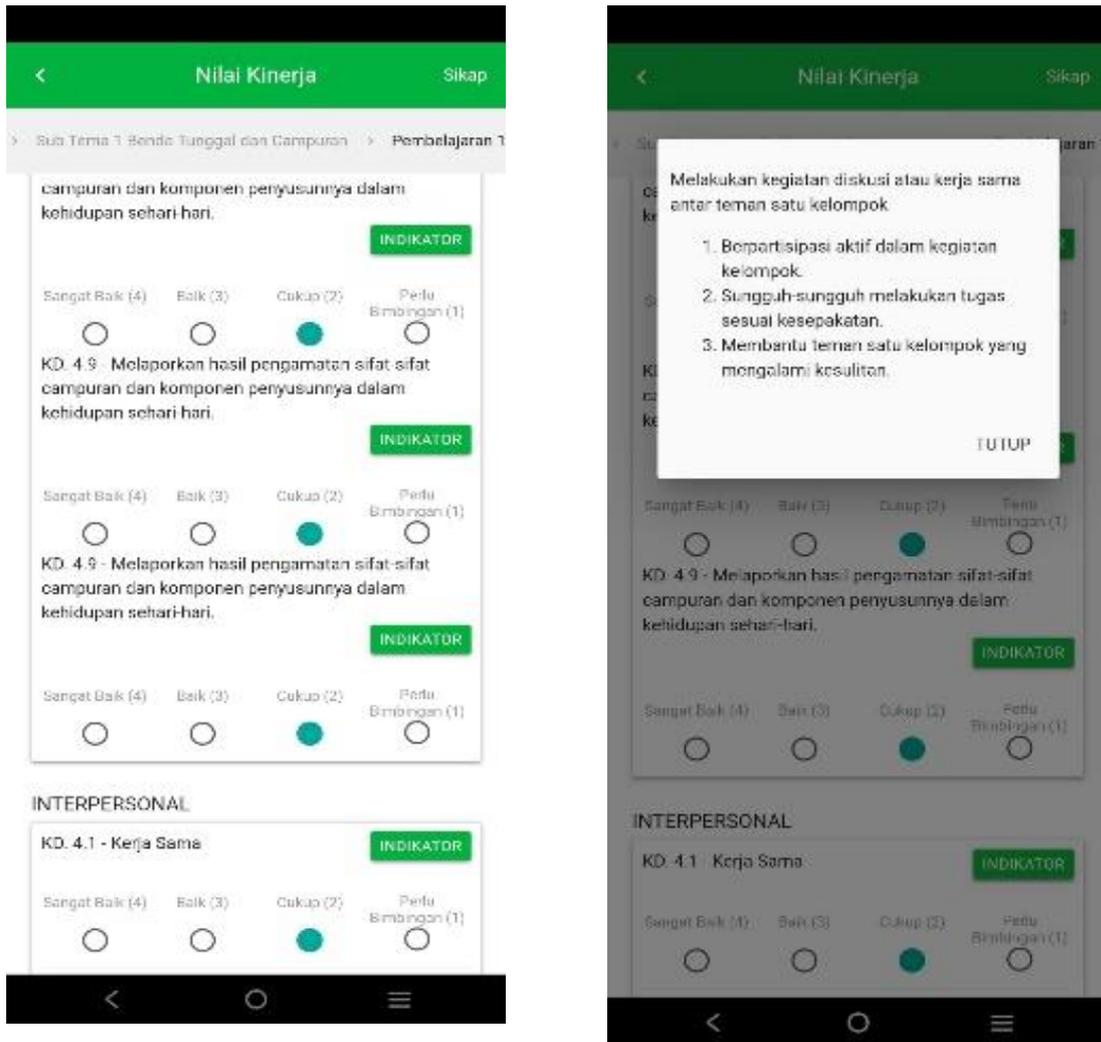


Figure 4. Display of rubrics and details of indicators of cooperation skills on an Android-based authentic assessment application

Students’ Responsibilities Analysis

Student responsibility skills are measured simultaneously in the observations of student performance assessments carried out during the learning process using ICT. The measuring indicators used in the attitude of responsibility

include (1) completing tasks according to targets, (2) collecting assignments on time, and (3) apologizing for mistakes made (Syafitri, 2017).

Figure 5 below is an attitude assessment display on an Android-based authentic assessment application.

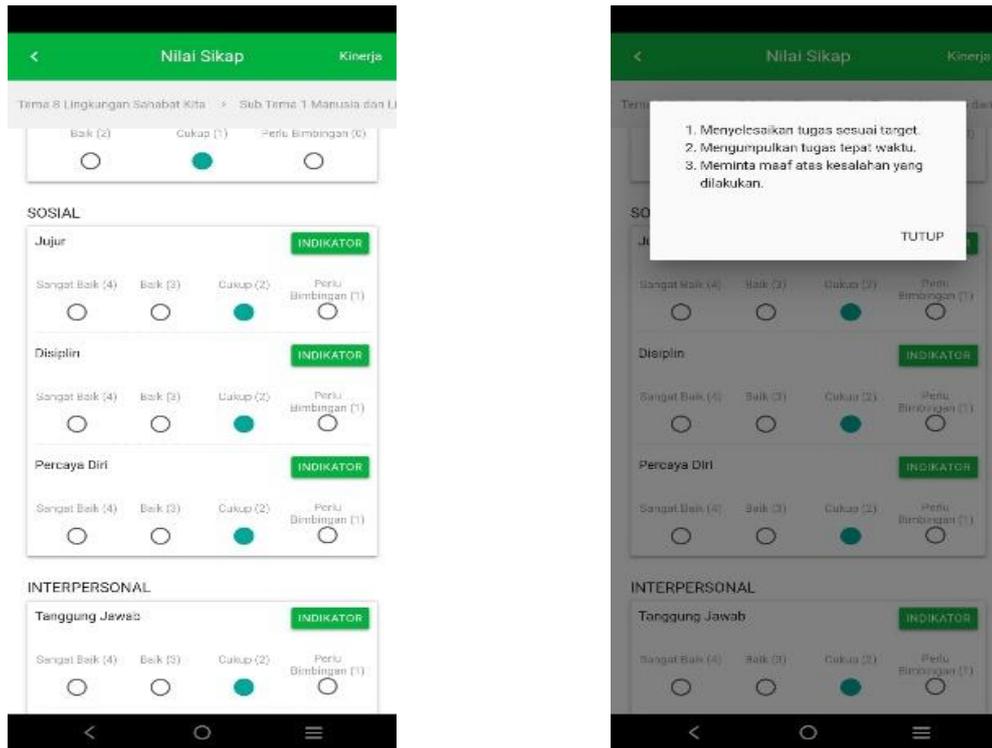


Figure 5. Display of rubrics and details of responsibility indicators in an authentic android-based assessment application

The following table 7 is the result of the analysis of students' responsible attitudes in learning with the eight themes about environments is our friend.

Table 7. The Analysis of Results of Students' Responsibility Attitude

| Indicators | Final Score | | | Mean | Criteria |
|------------------------------------|-------------|-----|-----|------|----------|
| | ST1 | ST2 | ST3 | | |
| Complete tasks according to target | 77 | 85 | 92 | 85 | Good |
| Collect assignments on time | 74 | 88 | 94 | 85 | Good |
| Apologize for the mistakes made | 63 | 84 | 88 | 78 | Adequate |
| Mean | 71 | 86 | 91 | 83 | Adequate |

Table 7 shows the results of the data analysis of the attitude of responsibility indicator showing an increase in the attitude of student responsibility in learning with an authentic ICT-based assessment system with a score of responsibility indicators with a final average of 83 with a student attitude score of 88 with good assessment criteria with the predicate B. This indicates that the attitude of student responsibility is increasing due to the use of ICT as motivation in learning. In addition, it is reinforced by the research results of Haqiqi, Mariani and Masrukan in Fitriani and Kurniawan (2021), that

responsibility will also affect students' cognitive and also student learning outcomes. The measurement of assessing students on the responsibility attitude have been known to be good, so it can be concluded in general that ICT-based the authentic assessment system is effective for measuring the responsibility, cognitive competence, and students teamwork. The application of ICT-based authentic assessment applications in learning is expected to improve the quality and efficiency of learning especially in the assessment learning theme environmental our friend and an alternative to optimize the

utilization of technology in the curriculum 2013 curriculum in the authentic assessment process.

Evaluation

The implementation product on larger group of learning in final activity of posttest also

distribution of response questionnaires to teachers and students who have used the developed product as supporting the feasibility of the developed product. The responses of teachers and students to the ICT-based authentic assessment application system are described in Table 8 and Table 9 below:

Table 8. The results of the teacher's response questionnaire on the product implementation test

| No. | Aspects | Score | Percentage (%) |
|------------------|--|-----------|----------------|
| 1. | Accuracy of display on authentic assessment program | 45 | 94 |
| 2. | Accuracy of features in authentic assessment programs | 45 | 94 |
| 3. | Readability of text in authentic assessment programs | 29 | 91 |
| 4. | Ease of operation of authentic assessment program | 47 | 98 |
| 5. | The convenience of operating an authentic assessment program | 46 | 96 |
| 6. | Compliance with the 2013 Curriculum | 46 | 96 |
| 7. | PUEBI compatibility | 45 | 94 |
| 8. | Measuring all aspects of the assessment | 45 | 94 |
| 9. | Measuring cognitive competence | 29 | 91 |
| 10. | Measuring interpersonal competence | 29 | 91 |
| 11. | Accuracy in measurement | 14 | 88 |
| Final Percentage | | 94 | |
| Criteria | | Very Good | |

Table 9. The Results of the Students' Response Questionnaire

| No. | Aspek | Skor | Percentage (%) |
|------------------|---|-----------|----------------|
| 1. | Appropriateness of appearance on authentic assessment program | 748 | 95 |
| 2. | Readability of text in authentic assessment programs | 758 | 96 |
| 3. | Ease of operation of authentic assessment program | 391 | 99 |
| 4. | The convenience of operating an authentic assessment program | 763 | 97 |
| 5. | Compliance with the 2013 Curriculum | 373 | 95 |
| 6. | Measuring critical thinking skills | 381 | 97 |
| 7. | Accuracy in measurement | 364 | 93 |
| Final percentage | | 96 | |
| Criteria | | Very Good | |

Positive results were obtained from the teacher's response to the implementation of an ICT-based authentic assessment system, as shown in Table 8 shows that the aspect of the ease

of operation of the authentic assessment program occupies the highest percentage score of 98%, followed by conformity with the 2013 Curriculum and the accuracy of features in the

authentic assessment program with a percentage of 96%. with an average overall percentage of 94% and got very good criteria. Student responses in Table 9 also strengthen this conclusion by obtaining 99% of the aspects of the ease of operation of the authentic assessment program, followed by the comfort aspect of operating the authentic assessment program by obtaining a percentage of 95% with an average percentage gain of 96% with very good criteria for the authentic assessment system. based on ICT that has been used in learning. With a program on an ICT-based authentic assessment system that is easy to use (user friendly), it has a positive impact on student learning motivation because it makes students more comfortable in completing assignments and creates a pleasant learning atmosphere (Aini, Dhaniarti and Khoirunisa, 2019).

In addition, the evaluation also has been done in previous phase as on the validation by media and material experts with improvements according to the suggestions and comments of the validator. At the product trial stage or limited trial there are also improvements according to teacher suggestions and researcher observations in the learning process. Improve-ments in the form of printing QR-Code with a larger size. In addition to teacher users, in the android application, namely in the assessment rubric, pop-up indicators and score ranges do not appear. Meanwhile on student accounts, the random question system for students does not work and allows students to do it more than once.

Revision of the limited trial must be carried out as a condition for going to the next stage, namely testing product implementation or testing in large groups. Product improvements from the android system, website and application manuals were carried out to increase the effectiveness and feasibility of an ICT-based authentic assessment system.

CONCLUSION

This study aims to determine the effectiveness and feasibility of an authentic ICT-based assessment system. Based on the results

and discussion, it is concluded that an authentic ICT-based assessment system is effective for measuring students' cognitive abilities with high criteria acquisition, excellent criteria for cooperation and good criteria for responsibility. Meanwhile, the feasibility of the product obtained very feasible criteria based on the results of the validation of material and media experts as well as the responses of teachers and students to the use of an authentic ICT-based assessment system.

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