Developing AKM Task with Ethnomathematics Based on Canva for Primary Students

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Abstract. The goal of this research is developing task used ethnomathematics as context using Canva application to assess numeracy skill of primary students. Ethnomathematics is the study of the relationship between mathematics and culture. Culture is the best context for students to learn mathematics because culture is very close to students daily lives. Canva chosen as medium to develop AKM task because it has many advantages, one of which is its attractive appearance and easy to use. This is the Research and Development method with the ADDIE model. The research subjects were 100 primary students throughout Malang Regency. The analysis stage starts from the content, context, and cognitive processes. At the design stage, the researcher designed essay questions based on content, context, and cognitive process-based AKM. Validity comes from empirical evaluation of validation and small group reliability testing. The implementation phase shows that the questions have a potential impact on students' numeracy literacy skills. The last part, the evaluation stage, shows that students need to improve their numeracy literacy skills to face the 4.0 revolution era. The conclusion is AKM task with ethnomathematics based on Canva are valid and reliable, so they can used by students. As well as the AKM question have a potential effect, which can improve students literacy skill.

Keywords: AKM · Ethnomathematics · Canva · ADDIE

1   Introduction

National Assessment or Minimum Competency Assessment or Assessment Kompetensi Minimum a.k.a AKM is one of the innovation in the educational system from The Indonesia government through The Ministry of Education and Culture. This innovation certainly refers to the student's needs to facing industrial era 4.0. Through AKM, The government want to know abilities of students in the field of the numeracy and literacy. Moreover, the result of AKM will be used to assess quality of school and determine the level of students competence. This level of competence can be used by teacher to develop effective, innovative, and quality learning strategies according to the level of students achievement [1].

In the first implementation of the AKM, many obstacles and problems were found in the school, such as unavailability of computer equipment and internet network, limited

preparation, teachers and students who are not ready with AKM task, and many more. Students not familiar with AKM task. AKM task adopted form PISA, and students rarely get questions that require higher-order thinking skills. Therefore, students find it difficult to work on AKM task [2].

Based on the result of interview with teachers, students need questions that can develop higher-order thinking skills and the context is close to students. Beside that, students have to read a lot, because AKM task require students to read with long reading. The lack of students interest in reading because students have love motivation to reading, low level of students intelligence, learning strategies that are still less effective, low creative thinking skills of students [3].

Therefore, the researchers tried to design an AKM task instrument with Canva-based ethnomathematics for elementary school students. Ethnomathematics is learning mathematics using cultural context. Culture was chosen as context because it very closed with students and directly related to students lives [3]. The ethnomathematics approach is make mathematics more relevant and meaning-full to students and can improve literacy skills of students [4].

In addition to using ethnomathematics, the AKM instrument are arranged based on Canva application. The Canva application is an attractive design application that has many options and is easy to use both online and offline [5]. With these varied and attractive designs, the Canva application can be used as an application for student learning media so that students can be motivated to learn [6].

This study is another option for the development of numeracy among primary school students. The importance of this research as part of innovation in learning for primary school students. In addition the development of ethnomathematics AKM tasks based on Canva is important to improve students numeracy skills. The results of this study will give an idea of the strategies that can be used to maximize the number of AKM.

The goal of this study is to develop AKM activities for elementary school students through Canva-based ethnomathematics to improve students numeracy. Products are validated and practically tested before being used by students. The results of this study will provide insight into strategies that can be used to increase AKM numbers.

1.1 Minimum Competency Minimum

National Assessment (AN) is an assessment program on the quality of each educational unit form primary and secondary levels. National Assessment is an assessed based on the learning outcomes of students (literacy, numeracy, and character), and the quality of the teaching and learning process. Information these are obtained from three main instruments, namely the Minimum Competency Assessment (AKM), Character Survey, and Learning Environment Survey [7].

Minimum Competency Assessment (AKM) is used by governments to measuring literacy and numeracy skill of students. Specially for numeracy literacy, AKM focus on numbers, geometry and measurement, algebra, and data & uncertainty. AKM for primary school divided by three level, namely level 1 (Grade 1& Grade 2), Level 2 (Grade 3 & Grade 4), and Level 3 (Grade 5 & Grade 6) [8]. Moreover, the Minimum Competency Assessment used personal, sociocultural, and scientific as context [9].

1.2 Ethnomathematics

Culture-based learning is a model of study approach that emphasizes the activities of students from different cultural backgrounds who can use different types of assessments in the study process of certain studies and in the evaluation of study results [10]. Furthermore, this learning is known as ethnomathematics. The learning activities are expected not only to understand the concept but also to understand the existing local culture [11].

On the AKM task developed by researchers, the culture used as context is the culture in several regions in Indonesia, as traditional houses, traditional food, traditional ceremonies, and activities related to regional culture elements. It purpose to introduce the diverse Indonesian culture to students. The context used by the researcher are Jenang Alot as traditional food from Sekaten Festival, Siwaluh Jabo as traditional house from Suku Karo in North Sumatera, Tambi House from Sulawesi, Subak from Bali, Batik from Java, Borobudur Temple form Magelang, and Festival Danau Toba from Sumatera.

2 Methods

This is research and development using ADDIE development model. This development options model consists of five stages from Analysis, Design, Development, to Implementation, and Evaluation.

1. Analysis stage. At this stage the researcher identify policies issues by the government, procedures for implementing AKM, standard question used for AKM, and also conducted interviews and observations to students, teachers, and school principals regarding readiness to face the National Assessment and students' numeracy literacy skills.
2. Design stage is began to develop research instruments based on the results of the analysis of field needs. The preparation of the design starts from the selection of materials, contexts, concepts, to the level of questions, to the types of questions that will be used in the instrument. The design of this instrument is still conceptual and will underlie the next development process.
3. Development stage includes the development of AKM task with ethnomathematics based on Canva that have been adapted to the design stage, followed by compiling expert test instruments, validation by expert, and continued revision based on result and suggestion from expert. Moreover, the task given to small group to determine the practicality of the task with students responses.
4. Implementation stage is phase to implementation the AKM task with ethnomathematics to research subject to find out the potential effect of the task.
5. The evaluation phase includes the formulation phase of evaluation which is carried out in each previous step as a process of product quality improvement..

AKM assignment using ethno-mathematics based on CANVA was given to 100 primary school students. The data for this survey was compiled from an actual experiment after students used the Canva application. The AKM feature relies on the Canva applications AKM for numerical geometry-based numbering. The purpose of the data analysis used in this study is to determine the validity and functionality of the product. Data analysis technique is qualitative descriptive analysis and quantitative descriptive

analysis. Quantitative descriptive analysis methods were used to analyze the data of student responses. Descriptive qualitative analysis techniques are used by practitioners and students to describe qualitative data from expert evaluations to provide suggestions for improvement.

3   Result

Developing AKMs task with ethnomathematics in a Canva-based program to support students numeracy skills. Figure 1 shows a view of the application page.

The title of the application is Asessmen Kompetensi Minimum with four menu and video view from youtube about kecakapan abad 21. From Apa itu AKM? menu, user can get information about AKM form website Pusmenjar. The information about ethnomathematics and the culture context used in to the task available in ethnomatematika. Menu games contain learning games form Quizizz. The last, Soal menu contain AKM task with ethnomathematics.

The Fig. 2. Showed that main page of AKM Task. The page serve information abaout AKM. The information based on website Pusmenjar with address https://pusmenjar.kem dikbud.go.id/akm/page.

The Fig. 3. Showed about ethnomathematics and Indonesian culture selected as context. The page contain information about the culture and its uniqueness. The culture used as context are Sekaten Ceremonial, custom home by Suku Karo, batik, and Borobudur Temple. On the ethnomathematics page, students can read information about Indonesian culture which is the context of the task.

The Fig. 4. Exhibit about AKM task with ethnomathematics. Students can read, solve the problems, and choose the right answer. The form of AKM task is connected to google form, so the researcher can observe the result of students. The available media and question have gone through several stage of validation by expert. The validation process with expert review done qualitatively. The expert review investigate the task by content, context, and language. The review process for the task can seen in Fig. 6.
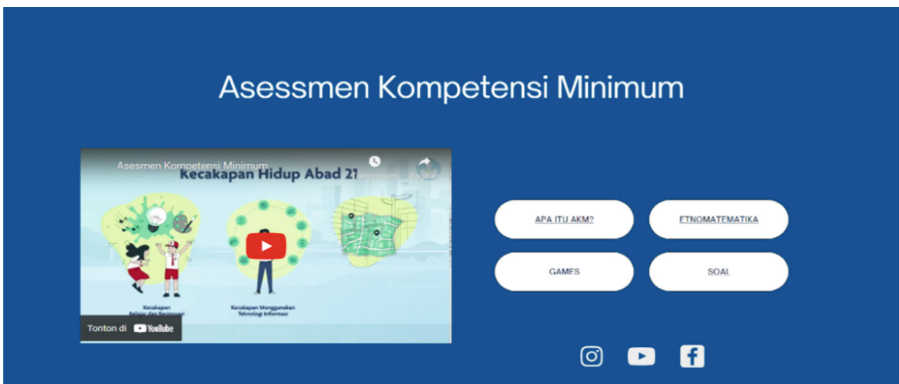

Fig. 1. The main menu of AKM Task on Canva Application

Fig. 2. The main page of AKM Task on Canva Application

Fig. 3. The main page of AKM Task on Canva Application

The Table 1 below will explain the comments of validators and the decision to revise the question based on the validators comment (Fig. 5).

Based on the result of Table 1, it was decided to improve the image in the problem. The revision can showed on the Fig. 6.

After revising the question by the expert, the question were tested inn small groups. The small group consist of 7 students with heterogeneous abilities. Beside that, the researcher analyzing the items by testing the validity and reliability of the items. The validity test used the Product Moment Correlation from Karl Pearson, and the reliability test used Cronbach-alpha. Afterward, the question were declared valid and highly reliable so that could be used for further test.
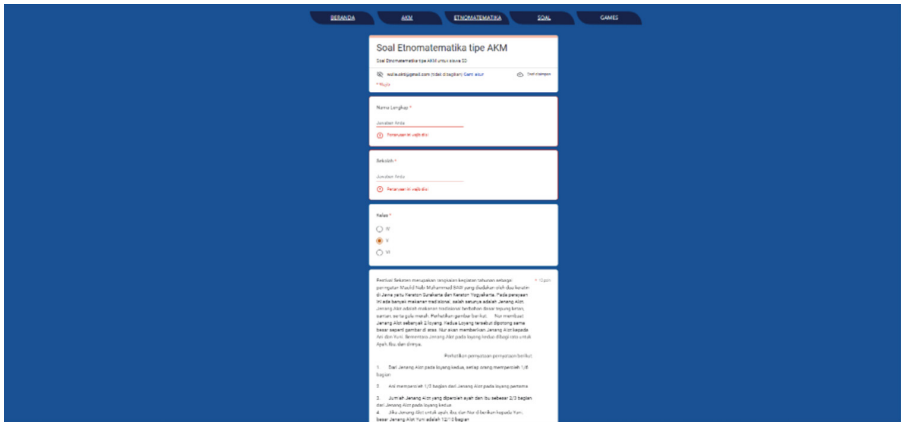
Fig. 4. The main page of AKM Task on Canva Application
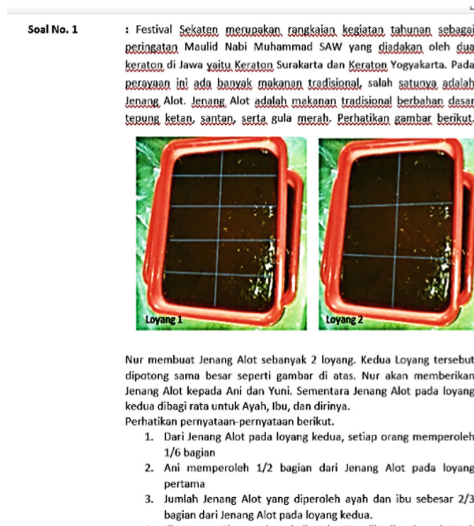
Fig. 5. The question before revision

4   Discussion

The AKM task based on Canva application given to 100 students in primary school. The subject came from four elementary school in Malang Regency. Before field test, the task given to small group consist 7 students and given to expert to review process. The result of small group and expert review used by researcher to fixed the application, content, and context.

The aims of field test is to find out the potential effect of the task. So, after students work on AKM task with ethnomathematics, the researcher interviewed 20 students to compare the result of students work with the results of questionnaires.

Table 1. The comment and question revision decision

Validator	Comment	Decision
V-1	- The picture of the questions are not clear, the lines need to be thickened again so that students can understand. - The picture dose not provide the required information about the problem.	Changing the pictures in the question.
V-2	- Information on the picture need to be added to match the question.	
V-3	- Question don't provide clear information	

Fig. 6. The question after revision

Based on Fig. 7. it appears that the literacy ability of students in solving AKM task with ethnomathematics is good. This is evidenced by a lot of students got score 70 – 80. The researcher made the task with 10 question, with 10 points for each question. And, if students got 70 or 80 point, its mean that students can answers 7 or 8 question correctly. These results indicate that students have good numeracy skills. By having good numeracy skills, students are capable on applying their mathematical knowledge in real life [12].

The numeracy skill in this research have three indicator; (1) the ability to use a variety of numbers and symbols related to operations on algebraic forms to solve problems in the context of everyday life; (2) analysis information (graphs, tables, charts, diagrams, and so on); and (3) interpret the results of the shock analysis to predict and make decisions [13]. The following are results of students interviews.
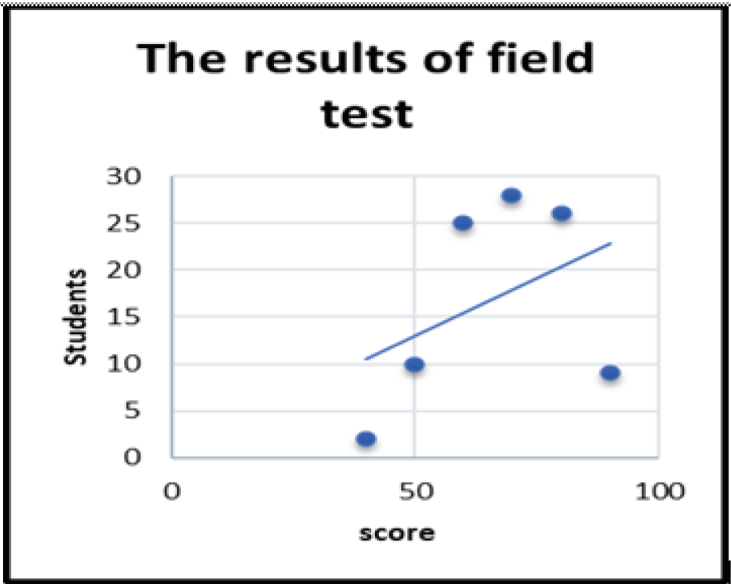
Fig. 7. The result of field test

Table 2. The result of interviewed students

Indicator	Description	Percentages
Using a variety of numbers and symbols associated with operations on algebraic forms to solve problems in the context of everyday life	- Choose the most important part of the problem - Converting ordinary sentences into mathematical models - Determine conclusion	75%
Analyze information (graphs, tables, charts, diagrams, etc.)	- Determine problem solving strategies - Predict conclusions	88%
Interpret analysis results to predict and make decisions	- Carry out problem solving strategies - Predict conclusions	85%

Based on Table 2., it can be said that students have numeracy literacy skills because they are able to reason mathematically and are able to use concepts, procedures, and facts to describe, explain, and predict an event that can be used to solve everyday problems [14].

The Table 3. Showed that students very interesting with AKM task with ethnomathematics. Students will be interested in contextual questions and questions like that can improve students' critical thinking skills [15]. In addition, doing non-routine questions will help students get used to critical thinking and improve students' reasoning and literacy skills [16].

Table 3. The response of students

Question	Respons of students
The questions given are interesting for me to work on	75%
I only work on a few questions that I find interesting	50%
I understand the problem well, so I can chage story problems into math sentences	20%
I relate the questions to the mathematical concepts I have studied previously	70%
The strategy I choose in solving the problem is based on the results of my analysis of the problem	85%
After doing the calculations, I give a conclusion to end my answer	35%
I feel the questions given are difficult and it takes me a long time to understand the questions	89%
I think questions with a cultural context are very interesting	95%

5   Conclusion

Based on the description above, it can be concluded that this research has produced a valid and practical AKM question instrument with Canva-based ethnomathematics. The question instruments that are arranged are also able to raise and improve students' numeracy literacy skills. This is evidenced by the results of student work and the results of interviews conducted by researchers to students after working on the questions. This is shown by more than 75% of students answering the task well and only making a few mistake.

As a suggestion, that this research needs to be developed again with more contexts and diverse content. This question can also be applied to teachers in elementary schools as learning materials.

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