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Assistance in Developing Numeracy Problems as Learning Assessments

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Abstract

Improving numeracy skills is essential, given that Indonesian students' numeracy achievements are still below standard. The Kurikulum Merdeka includes three types of assessments—Diagnostic Assessment, Formative Assessment, and Summative Assessment—forming a comprehensive series in the classroom learning process. These assessments provide an opportunity to enhance students' numeracy skills. Therefore, teachers must develop numeracy question to evaluate the learning process. SDIP YLPI, an active partner of the Mathematics Education Study Programme at Universitas Islam Riau, requires assistance in creating numeracy questions for the Kurikulum Merdeka. This community service aims to provide intensive assistance to classroom teachers at SDIP YLPI in preparing numeracy questions as learning assessments in the Kurikulum Merdeka. The activity began with the preparation of standard questions, which were then transformed into numeracy questions by focusing on the stimulus and its components. As a result of this community service, participants have successfully formulated two numeracy questions script for level 3 (grades 5-6). The questions in this assessment focus on the theme of numbers within a personal context, with an emphasis on ensuring a cognitive level of understanding. The format chosen for this assessment is multiple-choice, featuring true/false options.
Keywords: *Learning Assessments, Implementation of Kurikulum Merdeka, Numeracy Skills, SDIP YLP*

INTRODUCTION

Training in numeracy skills is now considered essential due to the low numeracy proficiency of Indonesian learners. In comparison to literacy skills, the numeracy abilities of Indonesian learners still fall below the standard. According to a report by the Indonesian Minister of Education and Culture, half of Indonesian learners do not meet the literacy standard, while two-thirds of Indonesian students have not attained the standard in numeracy skills.

Numeracy questions often reference PISA-form questions that prioritize reasoning processes over content (Amelia et al., 2023; Coffey & Sharpe, 2023). Numeracy skills involve the ability to analyze and use numbers and mathematical symbols to solve practical problems in everyday life contexts (Connolly et al., 2023; Geiger et al., 2015; Goos et al., 2014). According to the Direktorat Sekolah Dasar Kemendikbud (2021), numeracy refers to the ability to develop knowledge and skills in mathematics with confidence in all aspects of life.

Teachers are expected to provide numeracy question instruments to routinely train students in the learning process. According to the Centre for Assessment and Learning (Pusat Asesmen dan Pembelajaran/Pusmenjar), numeracy questions, as determined by the AKM (Minimum Competency Assessment) questions, consist of several components that require consideration. The (Centre for Assessment and Learning, 2020a) categorizes questions into four domains: Numbers, Measurement and Geometry, Data and Uncertainty, and Algebra. Additionally, questions can be classified according to their context, which can be Personal, Socio-Cultural, or Scientific. The cognitive level of a question can be categorized as Understanding, Application, or Reasoning. Finally, questions can be presented in various forms, including Description, Short Fill-in, Multiple Choice, Complex Multiple Choice, and Matching.

In relation to the learning process, numeracy can be measured as a form of assessment in the learning process (Aunio & Räsänen, 2016; Ghazal et al., 2014). There are three assessments in the Merdeka Curriculum, namely Diagnostic Assessment, Formative Assessment, and Summative Assessment. The Centre for Assessment and Learning states that students are now more focused on formative assessment than summative (Centre for Assessment and Learning, 2021). This means that assessment at each learning meeting is more demanding than assessments such as Daily Tests. Therefore, students' numeracy skills can potentially be measured at each face-to-face meeting.

Diagnostic assessment determines the teaching strategies that the teacher will design in the classroom, while formative assessment evaluates the success of the learning process at a particular meeting. Summative assessment serves to gauge the success of the learning process in several Learning Outcomes.

According to the Undang-Undang Republik Indonesia Number 14 of 2005 Concerning Teachers and Lecturers, the development of question instruments is deemed a routine activity for teachers. The law categorizes teachers as professional educators with the primary responsibility of educating, teaching, guiding, directing, training, assessing, and evaluating students across primary education, secondary education, and early childhood education in formal education channels. Creating effective question instruments can pose a challenge for teachers, particularly in the context of numeracy questions.

Sekolah Dasar Islam Plus (SDIP) YLPI is a school affiliated with YLPI, drawing attention from education experts, including academics from Universitas Islam Riau (UIR). Despite this, the preparation of numeracy questions as a learning assessment has not been fully optimized at SDIP YLPI. Aligning the preparation of numeracy questions with lesson planning could serve as a valuable set of tools for implementing the Kurikulum Merdeka at SDIP YLPI, with the ultimate goal being the improvement of students' academic abilities, particularly in numeracy.

After discussions with the head of the Sekolah Dasar Islam Terpadu (SDIP) of the Yayasan Lembaga Pendidikan Islam (YLPI) in Pekanbaru City, it was recognized that teachers at SDIP YLPI require assistance in preparing numeracy questions for the Kurikulum Merdeka. The desired product of the Community Service (PkM) is a question instrument that includes a grid, script, and alternative answers for one meeting. This instrument will function as a diagnostic, formative, and summative assessment tool.

Considering the issues highlighted by the partner, the situation of SDIP YLPI Pekanbaru City teachers presents a valuable opportunity for engagement in training activities through community service. This stems from the fact that these teachers hold at least an undergraduate or Bachelor degree, indicating a robust understanding of their pedagogical competence, including the capability to design grids and question papers. Located at the service partner's site, SDIP YLPI is well-equipped with facilities suitable for training activities, complete with a projector to enhance these sessions.

In response to the challenges faced by the partner, assistance is being provided to prepare numeracy questions as part of the learning assessments in the Kurikulum Merdeka. The goal of this proposed solution is to empower all class teachers at SDIP YLPI Pekanbaru City to create effective numeracy assessment tools for their classroom instruction.

METHOD

The community service activity involves all class teachers at SDIP YLPI and is executed by delivering numeracy question components, along with providing examples of numeracy question instruments during a single meeting. This encompasses grids, scripts, and alternative answers. Subsequently, teachers receive assistance in compiling numeracy questions.

The ongoing service activity program undergoes evaluation in several stages, as outlined below:

a) Evaluation of Activity

This assessment occurs after the service is completed. The team evaluates participant attendance and the mentoring activities provided to teachers. The success of this process is determined by participant attendance exceeding 80%, active teacher participation in PkM activities, and adherence to the planned activities.

b) Evaluation of Activity Result

The results of the service activity are evaluated at the end of the program by examining the numeracy question instruments prepared by the participants. The success of this evaluation is determined by the extent to which the numeracy questions meet the standard components. The assessment focuses on ensuring that the participants' numeracy questions align with the standard

components of such questions, and the success is measured based on this alignment.

RESULT AND DISCUSSION

On Friday, September 1, 2023, the PKM activity occurred at the SDIP YLPI Hall in Pekanbaru City. The event was attended by 15 class teachers from SDIP YLPI Pekanbaru City.

The session commenced with the presentation of materials to participants, focusing on the components of numeracy questions designed for elementary-level students in Phases A, B, and C.

Figure 1. Delivery of Materials for Numeracy Problem Components

The distribution for each component of numeracy questions in the AKM Grade 5 questions (Centre for Assessment and Learning, 2020b) is as follows:

Table 1. The Distribution of Numeracy Problem for Grade 5 in AKM

	Percentage
Domain	
Numbers	40%
Measurement and Geometry	25%
Data and Uncertainty	25%
Algebra	10%
Context	
Personal	60%
Socio-Cultural	30%
Scientific (Intra-Mathematics)	3%
Scientific (Extra-Mathematics)	7%
Cognitive	
Knowing	30%
Applying	50%
Reasoning	20%
Question Form	
Description	5%
Short Essay	5%
Multiple Choice	20%
Complex Multiple Choice (more than 1 correct answer, true/false, yes/no)	60%
Matching	10%

Participants selected the personal context to create numeracy questions from the available components. Additionally, they identified the numeracy domain at level 3, intended for grades 5 and 6, which entails a knowing of complex multiple-choice questions (true/false). This information is presented in Figure 2 below.

Level	Domain	Konteks	Level Kognitif	Bentuk Soal
3	Bilangan	Personal	Knowing/ Pemahaman	Pilihan ganda kompleks (benar/salah)

Figure 2. Numeracy Problem Composed by PKM Participants

In the process of creating numeracy questions, teachers utilize existing questions and modify them to align with the AKM numeracy question components. This method is preferred because it is simpler for classroom teachers who already have a question bank. Additionally, modifying existing questions is easier than creating new ones. As a result, participants were able to create two numeracy questions from a single stimulus.

The evaluation of this service activity comprised several stages.

a) Evaluation of Activity

The participants who attended were 15 out of 18 class teachers in SDIP YLPI Pekanbaru City. This means that the attendance of participants has exceeded 80%. In addition, participants were active in asking questions and discussing during the activity.

b) Evaluation of Activity Result

Because participants were able to develop a set of numeracy questions for level 3 (grades 5-6), this activity was considered successful. This question paper can also be used in the classroom as a diagnostic, formative, or summative assessment (Amelia et al., 2023).

CONCLUSION

1. This PkM activity can train teachers' skills in developing numeracy questions as classroom assessments.
2. During the activity, participants successfully collaborated to design two numeracy questions.

EXPRESSION OF THANKING

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