

## **STRENGTHENING NUMERACY FOR VOCATIONAL HIGH SCHOOL TEACHERS TO REALIZE CENTERS OF EXCELLENCE (TRAINING AT SMK KRISTEN 2 SURAKARTA)**

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### **ABSTRACT**

Having numeracy skills enables individuals to function effectively in daily life and contribute to society. It also enhances their opportunities in the workforce and establishes a solid foundation in mathematics that can be built upon through lifelong learning. Various studies and surveys show that literacy and numeracy levels in Indonesia remain low. One such study, the Program for International Student Assessment (PISA), revealed that Indonesia ranks 68th with the following scores: mathematics (379), science (398), and reading (371). Several factors contribute to the low literacy and numeracy levels in Indonesia, including limited access to quality education. SMK Kristen 2 Surakarta has the vision to become a Center of Excellence, developing various sectors in education so that graduates possess excellent competencies in the manufacturing field. The Numeracy Strengthening Workshop for teachers is an effort to improve teacher competence in enhancing students' ability to use numbers, data, graphs, and mathematical formulas to apply simple calculations in daily life. This numeracy strengthening is not only for mathematics teachers but also for teachers of all subjects, enabling them to create and implement learning outcomes that include numeracy elements. The two-day numeracy strengthening training at SMK Kristen 2 Surakarta used the Numeracy Competency Improvement Module for Teachers provided by the Ministry of Education, Culture, Research, and Technology. Three modules were completed during the workshop: Professional Learning Practice in the Aspect of Assessment, Numeracy Learning Environment, and Numeracy Opportunities and Demands. At the end of the workshop, all participating teachers designed learning outcomes in their respective subjects, selecting materials with numeracy content, determining the methods to be used, and choosing appropriate learning tools. Presentations and discussions were conducted to gather input and refine the teaching methods.

**Keywords:** Strengthening, numeracy, learning outcomes, competence

### **INTRODUCTION**

Based on the school's education report data in 2022, it shows that the priority indicator that has not achieved a good achievement is numeracy. Less than 50% of students have reached the minimum competency for numeracy. Students only have limited mathematical knowledge (partial mastery of concepts and limited computational skills). Subject teachers (other than Mathematics) have the perception that improving students' numeracy skills is the responsibility of mathematics teachers. As a result, subject teachers other than mathematics do not pay attention to improving students' numeracy skills at school. Based on this, good practices need to be shared to inspire fellow teachers in improving students' numeracy skills through activities that integrate numeracy reinforcement into Indonesian language learning activities. (Maudia, 2024) The learning from this whole process is that there needs to

be collaboration between the school principal, subject teachers, students, and local government in improving students' numeracy skills. In addition, it is very important to present free learning and free teaching in every learning process so that students can learn effectively, efficiently, and enjoyably because they learn according to their learning needs. (Benu, Wonda, & Bulu, 2024).

## METHOD

The numeracy enhancement workshop at SMK Kristen 2 Surakarta was conducted by all teaching staff of SMK Kristen 2 Surakarta, referring to the fundamental principles of the Center of Excellence School program implemented in 2024. The event involved employees and teachers as committee members, and was held in the SMK Kristen 2 auditorium for two days, Wednesday-Thursday, August 21-22, 2024. The strategy used to achieve the objectives of the activity was as follows: on the first day, session 1 involved a presentation on Professional Teaching Practices in Assessment, followed by session 2 for discussion. On the second day, a presentation was given on the Learning Environment and Opportunities and Demands of Numeracy, followed by session 2 where participants practiced designing learning outcomes that incorporated numeracy elements into each subject they taught. The results of the practice of designing learning outcomes were presented through discussions to obtain input, feedback, or evaluation from workshop participants. The learning used in this workshop was activity-based, where participants would form experiences that would help their knowledge and skills to develop further. (Dassa & Assagaf, 2023).

## RESULTS

In this community service activity, workshop participants have identified or mapped the learning outcomes (LO) of subjects other than mathematics. Participants have also received input from other groups regarding the results of this mapping. Furthermore, participants selected and discussed together in groups about LOs in one phase or one academic year that have opportunities and demands for numeracy (Yayuk & Restian, 2023). The results of the discussion on learning activity plans are as follows:



**Figure 1.**  
**Diagram of Numeracy Identification and Activities**

The intensive two-day numeracy workshop held at SMK Kristen 2 Surakarta resulted in the development of various tools to facilitate instruction. These tools have provided teachers with practical strategies for integrating numeracy into their subject-specific teaching. Workshop participants actively engaged in creating learning outcomes infused with numeracy elements across all their taught subjects.

**Table 1. Worksheet For Creating Numerical Learning Outcomes for One Academic Year**

Number	Subject	Element	Learning Outcome	Numeracy Activity
1	Visual Art	Creating	At the end of this phase, students are able to visually express their experiences as a creative expression, using measuring tools to draw in detail, even though the results may not yet show optimal proportions. It is expected that by the end of this phase, students will be able to recognize and use basic skills and knowledge about the visual elements of line, shape, texture, space, and color using materials, tools, and procedures of their choice in creating 2D and 3D artworks.	Using a ruler and measuring tools to draw 2D or 3D artwork



**Figure 2.**  
Worksheet for Creating Numeracy Learning Objectives



**Figure 3.**  
Community Service: Strengthening Numeracy Skills of Teachers at SMK Kristen 2 Surakarta

## DISCUSSION

Based on various national and international surveys, the numeracy skills of students have consistently shown no significant improvement, and in fact, have tended to decline year after year. For instance, the Programme for International Student Assessment (PISA) conducted by the Organisation for Economic Co-operation and Development (OECD) revealed that approximately 71% of Indonesian students did not reach the minimum level of mathematics competency. Given this situation, it is expected that educators have a comprehensive understanding of literacy and numeracy concepts and can apply them in meaningful learning. (Dasar, 2023).

Community service activities focused on strengthening teachers' numeracy competencies complement the competency model for teachers by providing a detailed map of numeracy competencies; giving teachers a reference to map their learning journey; and providing a reference for educational institutions to design and implement teacher training and mentoring programs related to numeracy competencies. (Shafira, Rokhmawati, & Perdana, 2023).

This community service activity trained workshop participants to reach a competent level in the dimension of professional learning practices, specifically in the aspect of assessment. The scope of this assessment aspect is how to identify and develop different strategies and answers from students in solving numeracy problems. At the competent level, training participants learn to describe various problem-solving strategies and possible student answers that differ from the taught methods. The results of this workshop were used by the participants, namely the teachers, to recognize and identify the most effective learning environments according to the conditions and potential of the school environment and the diversity of students, as well as the results of initial learning diagnoses in students to be able to create interactive and enjoyable learning. Learning that can provide opportunities for students to develop independent thinking skills, take risks, and conduct critical investigations in every numeracy learning. Workshop participants received worksheets to map learning outcomes containing numeracy into the learning materials they taught. Discussions and evaluations from groups and resource persons enriched participants' insights in fostering opportunities and demands for numeracy in each learning outcome of each subject. (Kebudayaan, 2021)

## CONCLUSION AND SUGGESTION

This community service activity in the form of a Numeracy Competency Enhancement workshop has resulted in the workshop participants, the teachers of SMK Kristen 2 Surakarta, being able to identify and develop differences in students' strategies and answers in solving numeracy problems. They are also able to describe various problem-solving strategies and possible student answers that differ from the taught methods. Workshop participants have the ability to map Learning Outcomes of subjects other than mathematics that have the potential to integrate numeracy. The workshop results have been developed into a module that is used as a reference for teachers in identifying the most effective learning environments according to the conditions and potential of the school environment and the diversity of students, in order to create interactive and enjoyable learning experiences.

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