THE CONCEPT OF A MATHEMATICS LITERACY LEARNING MODEL BASED ON LOCAL WISDOM IN INCLUSIVE HIGH SCHOOLS IN DENPASAR CITY

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A R T I C L E   I N F O

Abstract. Inclusive schools with an educational service system require that children with special needs be educated alongside their peers according to their abilities. Until now, a model for mathematics literacy learning based on local wisdom in inclusive high schools has not been available. This study aims to: (1) Analyze local wisdom in inclusive high schools, (2) Analyze the model of mathematics literacy learning based on local wisdom in inclusive high schools, and (3) Construct the concept of a mathematics literacy learning model based on local wisdom in inclusive high schools. This study uses both quantitative and qualitative approaches. The quantitative results illustrate the analysis of the influence of local wisdom-based learning (X) on learning independence (Y1) and student creativity (Y2), as well as the role of teachers in developing mathematics literacy learning models in inclusive high schools in Denpasar City. The qualitative approach is conducted to complement the data collected using the quantitative approach. The qualitative analysis results can be summarized as follows: (1) The model for mathematics literacy learning based on local wisdom in inclusive high schools needs improvement. (2) The implemented model of mathematics literacy learning based on local wisdom in inclusive high schools are highly varied, and (3) It is urgent and necessary to formulate a new concept for a mathematics literacy learning model based on local wisdom for students in inclusive education schools. The development of this new concept needs to involve various parties, including policymakers, community leaders, and program implementers such as school principals, teachers, and parents..

INTRODUCTION

Children with special needs can be defined as children who require education tailored to their learning obstacles and individual needs (Ahdiyat et al., 2017). The scope of children with special needs concept can be categorized into two main groups: children with temporary special needs and children with permanent special needs (Fransisca et al., 2021). An inclusive school is one that provides educational services requiring that children with special needs be educated at school according to their abilities alongside their peers (Lastaria, 2019). Inclusive education is an approach aimed at meeting the learning needs of all children without differentiation or separation (Sakiinatullaila, 2020). Inclusive education involves placing children with mild, moderate, and severe disabilities fully in regular classes. Learning barriers experienced by an individual provide teachers with insight into what kind of assistance

should be given to that child. When a teacher starts thinking about what support should be provided to a particular child, they are essentially identifying that child's learning needs (Ulva et al., 2020).

The concept of mathematics literacy must be connected to reality, be close to students, and be relevant to community life to have humanistic value. Mathematical material should be presented as human activity. However, the concepts of mathematics literacy that are taught may seem far from students' daily lives. One alternative solution is education that shapes students' characters in accordance with the character traits passed down. Education based on local wisdom is education that is more grounded in cultural values (Harahap, F. S., 2022).

Improvements in students' understanding of mathematics literacy concepts tend to be significant due to the teaching model applied (Widana et al, 2023). In mathematics literacy learning, local wisdom can bring mathematics closer to everyday life or the environment where students live. In terms of character education reinforcement, local wisdom contains character values based on the noble values of national culture (Ikhwanudin, 2018). Local wisdom has diverse values, and the way of delivering or educating students to understand those values can also differ. The implementation of cultural values or local traditions in teaching is crucial for teachers to focus on today. The use of modules based on local wisdom is expected to preserve the positive culture values of nation in learning and lead to optimal learning outcomes (Rahmawati et al., 2022).

Therefore, the development of a learning model based on local wisdom is crucial in developing uniqueness and culture. Education based on local wisdom equips students with knowledge, skills, and behaviors to have a deep understanding of the environment and the needs of society in line with local values/rules and supports regional and national development (Pujiastuti, H., & Mutaqin, 2020). Local wisdom is a broad and comprehensive phenomenon found in traditions, history, education, arts, religion, and more (Wibowo et al., 2023). Local wisdom has diverse values, and the approach to educating students to understand these values may vary. The use of modules based on local wisdom is expected to preserve the positive cultural values of the nation in learning and result in maximum learning outcomes (Widana, 2022).

Inclusive education is a promising development, but on the other hand, there are fundamental issues currently faced, namely whether children with special needs in inclusive schools have received appropriate and effective learning services (Surat & Sukendra, 2022). However, in daily practice, it seems that teachers may not fully understand the learning difficulties faced by these students (Tarjiah, 2015). Inclusive schools are those that accommodate all students in the same class. These schools provide an appropriate and challenging education program tailored to the abilities and needs of each student, with support from teachers to ensure students succeed (Ahdiyat, 2017). The research findings show that the model for teaching mathematics in inclusive schools must differ. A mathematics literacy learning model based on local wisdom can accommodate all students, including those with special needs (Difinubun, 2022). There must be a new concept for a mathematics literacy learning model based on local wisdom in inclusive schools to support the fulfillment of children's learning needs. The research objectives are: (1) To analyze the concept of local wisdom in inclusive high schools, (2) To analyze the mathematics literacy learning model based on local wisdom in inclusive high schools, and (3) To construct a concept for a mathematics literacy learning model based on local wisdom in inclusive high schools.

The urgency of research on the mathematics literacy learning model in inclusive schools is to accommodate all students, including those with special needs (Rianto, 2023). The research findings show that in the learning process across various subjects, particularly mathematics literacy, educators provide good services to both special needs and non-special needs students (Sukendra et al., 2022). Furthermore, the involvement of parents and the provision of facilities and infrastructure are critical components that must be considered in the implementation of mathematics literacy learning model in inclusive schools (Sukendra et al., 2023). Until now, there has been no established concept for a mathematics literacy learning model based on local wisdom in inclusive education. Therefore, this research is urgently needed to meet children's learning needs. The relevance of this research is to construct a new concept for a mathematics literacy learning model based on local wisdom for inclusive schools.

METHOD

The data were analyzed using descriptive statistics. The results of qualitative and quantitative data analysis were used as the basis for formulating a draft concept for a mathematics literacy learning model based on local wisdom in inclusive high schools. The design of this new learning model concept involved the education department, the community, parents, and mathematics teachers (Yudiani, 2022). The research population comprised educational units providing services for inclusive students in Denpasar. The research object was the mathematics literacy learning model based on local wisdom implemented in educational units offering inclusive services. Data collection took place at SMA N 7 Denpasar, SMA PGRI 1 Denpasar, and SMA N 8 Denpasar. Sampling was determined using a purposive sampling technique. Data were collected through observation guidelines, interviews, questionnaires, and document studies. Data validity was ensured through extended participation, enhanced diligence during the research process, triangulation, and intensive discussions with the research team, member checks, and negative case analysis.

The research population included high school mathematics teachers in inclusive schools in Denpasar. For the quantitative approach, sample selection used a cluster random sampling technique, while for the qualitative approach, purposive sampling was employed. The purposive sampling method was chosen because the schools represented variations in religion, culture, and region. The research object was the evaluation of learning and local wisdom in schools providing inclusive programs. The selection of the object was based on the distinct characteristics of their regions, including differences in culture, religion, and belief systems.

The study began with a limited test by experts through a Focus Group Discussion (FGD). The draft concept of the mathematics literacy learning model was tested by experts in educational measurement and evaluation, local wisdom, and inclusive education services. The testing employed a checklist instrument tailored to each expert's area of expertise. The data were analyzed qualitatively and descriptively. Based on the expert evaluation results, revisions and refinements were made to the draft concept of the mathematics literacy learning model, which was implemented in local wisdom-based learning in inclusive high schools. A broad field test was conducted by involving the education department, the community, parents, and mathematics teachers to gather input on the new draft concept of the mathematics literacy learning model. This process used a checklist instrument and open-ended questionnaires specific to each field, then the data analyzed qualitatively and descriptively. The final stage of research was the finalization of new concept for a mathematics literacy learning model based on local wisdom in inclusive high schools in Denpasar.

RESULTS AND DISCUSSION

The research findings are divided into two parts: results obtained through quantitative and qualitative approaches. The quantitative research findings illustrate the analysis of local wisdom-based concept (X) in relation to learning independence (Y1) and students' learning creativity (Y2), as well as teachers' ability to develop a mathematics literacy learning model in inclusive high schools in Denpasar.

Quantitative Research Data Description

The data from the research show that the independent variable is the local wisdom-based learning model, while the dependent variables are the independence and creativity of teachers in developing a mathematics literacy learning model based on local wisdom in inclusive schools. Before performing MANOVA analysis, a descriptive analysis was conducted first. The prerequisite tests for analysis included normality testing and multivariate testing. The results of the normality test are presented in Table 1 below.

Table 1. Normality Test of Research Data

Group	Kolmogorov-Smirnov*			Shapiro.Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Y1 Treatment	.053	231	.200*	.991	233	.336
Control	.031	230	.200*	.993	232	.685
Y2 Treatment	.039	231	.200*	.992	233	.682
Control	.039	230	.200*	.991	232	.561

*This is a lower bound of the true significance

Qualitative Description

The qualitative analysis complements the data obtained using the quantitative approach. Qualitative data describe aspects that the quantitative approach could not explain. Data collection was conducted through interviews and document studies, focusing on the concept of a local wisdom-based mathematics literacy learning model in inclusive schools. Denpasar was chosen due to its students' unique characteristics, shaped by differences in habits, culture, religion, and beliefs. Data validity was ensured through extended participation, increased diligence during research, triangulation, and intensive discussions with the research team, member checks, and negative case analysis.

After conducting a componential analysis, further analysis involved detailing, grouping, identifying relationships and differences, and exploring inter-domain connections to gain a deep understanding of the research object. Interviews, observations, and document studies revealed that mathematics teachers in inclusive schools generally lack proficiency in developing learning evaluations. Many teachers admitted they had not received training or socialization on developing learning instruments suited to their needs. As a result, teachers independently created highly varied learning instruments across inclusive schools in Denpasar. Even within the same province, teachers' abilities to develop learning instruments differed significantly.

Regarding quantitative analysis, teachers expressed mixed opinions about assessing question difficulty and discriminative power. Some believed existing assessment instruments were adequate, while others felt more complex and untested mathematics literacy items might further challenge students. This reflects a lack of commitment among some teachers to provide optimal services for their students. Teaching in inclusive schools requires a calling

to serve all children, including those with disabilities, with empathy and dedication.

Teachers trained under the "*Guru Penggerak*" (Driving Teacher) program demonstrated better skills in creating test blueprints and exam questions. However, their blueprints often did not meet formal standards, such as properly defining cognitive levels or including all components of a local wisdom-based learning model. Additionally, many questions lacked compliance with item-writing principles regarding content, structure, and language. This highlights a lack of teacher collaboration, an essential activity for enhancing professionalism. Exchanging information for teachers is an activity that must be carried out to increase teacher professionalism. Teachers' curiosity needs to be increased, especially in the current era where the world of education is developing so dynamically that teachers need the latest information to be able to keep up with developments in the world of education.

Indicators of teacher autonomy include initiative, ability to identify needs, set goals and targets, manage and monitor issues, view challenges as opportunities, use appropriate resources, select learning strategies, implement them, and evaluate outcomes. Field observations revealed that teachers in inclusive schools demonstrated discipline, as evidenced by their reflection activities before class. These reflections, introduced during training programs, fulfilled indicators of self-awareness and situational understanding. In inclusive schools in suburban areas, teachers showed patience in addressing diverse student needs, providing additional support for students with below-average abilities or special needs. Many self-taught using government-provided platforms like "*Merdeka Mengajar.*" Autonomous behaviors observed among mathematics teachers included: (1) Readiness to teach students from diverse backgrounds, (2) Participation in self-development activities such as seminars and workshops, (3) Effective lesson planning, (4) Voluntarily supporting students based on their learning needs, (5) Completing teaching duties according to school policies, (6) Arriving at school before classes begin.

Understanding the concept of a local wisdom-based mathematics learning literacy model is carried out to determine whether the learning objectives have been achieved or not. The mathematics literacy learning model can provide an overview of things that have been achieved and those that have not been achieved, decision making, and how follow-up actions will be taken. Teachers can utilize this model for assessment as learning, of learning, and for learning. Optimal use of the model can enhance learning outcomes. Interviews revealed that Denpasar's mathematics teachers had limited understanding of the local wisdom-based mathematics literacy model. Most teachers admitted that they did not implement the mathematical literacy learning model. The teachers were very confident that the questions in the textbook were of good quality, but when asked what the indicators of quality questions were, the teachers could not answer them. In the implementation stage of the concept of a local wisdom-based mathematical literacy learning model, teachers generally did not involve parents in testing activities, even though the role of parents in providing important information that teachers did not know was very important as initial knowledge for teachers. The teachers confidently carried out the testing according to their respective methods. Teachers generally did not understand the correct scoring techniques, especially for descriptive questions. Many teachers were unable to distinguish between grades and scores. As a result, when processing grades, there was a possibility that the assessment results would be inaccurate. Likewise, in the evaluation stage, many teachers did not make follow-up plans, for example whether they would carry out remedial or provide enrichment for students who had achieved minimal completion. It should be that at the end of each test, teachers are required to implement a follow-up plan so that all students are able to achieve the minimal

completion criteria. Thus, there is a need for a concept of a local wisdom-based mathematics learning model in inclusive high schools in Denpasar.

CONCLUSION

Based on the analysis of quantitative and qualitative data, the following conclusions can be drawn. **First, m**athematics literacy learning based on local wisdom in inclusive high schools needs significant improvement. School principals, as leaders, must demonstrate strong commitment by providing opportunities and continuously encouraging mathematics teachers to learn about the concept of local wisdom-based learning before developing and implementing such models. **Second, t**he mathematics literacy learning models implemented in local wisdom-based learning at inclusive high schools in Denpasar vary greatly. This variation stems from the influence of the local wisdom-based learning model (X) on learning independence (Y1) and learning creativity (Y2) in developing mathematics literacy learning models in these schools. School principals must facilitate and create adequate space for mathematics teachers to enhance their capacities through various developmental activities. Third, there is an urgent need to formulate a new concept for a local wisdom-based mathematics literacy learning model in inclusive schools. Developing this new concept requires collaboration among various stakeholders, including policymakers, community leaders, school principals, teachers, and parents. Parents' involvement is particularly crucial as they possess deep insights into their children's unique characteristics, which are essential for effective learning. Thus, constructing a well-defined local wisdom-based mathematics literacy learning model for inclusive high schools in Denpasar is necessary to ensure better learning outcomes and inclusivity.

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