

CIPP Model as a Mathematics Learning Evaluation Model in Elementary School

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Abstract

The development of learning mathematics can be seen through the implementation of the evaluation. The CIPP evaluation model is one of the models used to evaluate mathematics learning. This research aims to see the results of the evaluation of the mathematics learning process in elementary school X by using the CIPP model. The approach in this research is through a qualitative approach with an evaluative method. The study results found that in terms of context, the quality and suitability of the objectives of learning mathematics were already in a good category. Then the evaluation of the inputs saw how the goals of the mathematics learning program from the scope of students, teachers, materials, and facilities and infrastructure were in very good condition. Furthermore, evaluation in the process that sees how the requirements of the implementation of learning are in a good category. Finally, the product evaluation looks at the student's learning achievement and the teacher's learning tools, where this evaluation is also in the very good category.

Keywords: *Evaluation, CIPP, Mathematics Learning, Elementary School.*



A. INTRODUCTION

Education is expected to help students in developing themselves in a better direction. Education needs to be considered and evaluated regularly and continuously so that students become more qualified. Quality education can provide satisfaction to all education components and other supporting components. These elements start from students, curriculum, leaders, educators, academic staff, facilities and infrastructure, and society (Ryan & Deci, 2020). The education components in question are the curriculum, teaching staff, education staff, facilities and infrastructure, the environment, and the learning process. All education components are applied optimally at all levels of education and in all subjects, including mathematics (Apriana et al., 2019).

Mathematics is a universal science. Suherman stated that mathematics is the science of thinking and processing logic quantitatively or qualitatively. The application of mathematics is needed in all aspects of life. Mathematics has its characteristics with numbers and symbols (Syamsuddin et al., 2021). The school mathematics structure consists of counting, numbers, geometry, and measurement. Often, it is found that some students are afraid of mathematics. For them, learning

mathematics becomes more stressful and traumatizing. But some schools have managed to get out of the scary math mindset (Garba et al., 2020).

Learning mathematics for students to form a mindset that understands understanding, reasoning, and problem-solving. Suherman argues that mathematics functions as a mindset, tool, and science or knowledge. The National Council of Teachers of Mathematics states that there are principles in Suherman's mathematics learning (Amalia, 2018). The four principles are mathematics as problem-solving, reasoning, communication, and relationships. The process of learning mathematics, starting from elementary school to university, should always be evaluated to suit the learning objectives themselves and keep up with the times. The progress of learning mathematics can be monitored to what extent it is progressing by conducting an evaluation process (Dolapcioglu & Doganay, 2020).

The world of education requires an evaluation process. Evaluation is the primary need of all institutions, including educational institutions. With the evaluation, we can know the progress of the development of an educational program. The development of a program for the better or vice versa (Kioupi & Voulvoulis, 2019). Evaluation has two characteristics, namely macro and micro. Macro evaluation in the education sector targets the program. Meanwhile, those that are micro in education target learning achievement assessments. Students' learning achievement in the class in question is the cognitive ability and affective and psychomotor abilities (Barrot, 2021).

Of course, implementation of learning cannot be divorced from evaluation. Evaluation is the process of gathering data to ascertain the extent to which, how, and to what extent educational goals have been met, and if not, how, and why. The evaluation process is covered in detail here, beginning with the assessment of inputs, learning outcomes, outputs, and instructional strategies (Hasan & Bao, 2020). Silverius noted that the learning evaluation sought accurate data on the achievement of learning objectives, and then a decision on follow-up was made. Meanwhile, Hamzah asserts that the evaluation of mathematical education includes four objectives (Mardapi & Herawan, 2018). The initial purpose is to have a general understanding of the capacity for learning. The second purpose is to ascertain the degree of success in learning. The final purpose is to maintain contact. The final objective is accountability. Numerous evaluation models exist to ensure the evaluation process's success (Huber & Helm, 2020).

Kaufman and Thomas classify several types of models in implementing the evaluation. First, Goal Oriented. Second, Goal free. Third, formative-summative. Fourth is the countenance evaluation model. Fifth, is the Responsive evaluation model. Sixth, CSEUCLA (Winaryati & Hidayat, 2020). The seven CIPP evaluation models and the last is Discrepancy Model. Meanwhile, according to Nana Sudjana and Ibrahim, there are four evaluation models. Measurement, congruence, educational system, and illumination (Suyasa & Divayana, 2021).

In various elementary schools, the students must study different basic subjects. One of the compulsory basic lessons is mathematics. However, some students feel that

mathematics is a subject that requires a lot of thought and energy. This situation also affects students' lack of enthusiasm, resulting in low mathematics learning outcomes (Century et al., 2020). The success of learning mathematics requires the support of all parties and aspects in the school. The role of teachers with good competence is needed in evaluating mathematics learning. They should have insight into how to conduct evaluations correctly and according to needs (Musa, 2021).

Elementary School X itself is a madrasa that balances students' science and technology abilities with faith and piety. The process of achieving the goals of an educational institution depends on all components, including the curriculum, infrastructure, students, education staff, and the learning process (Prasetyo, 2022). Elementary School X implements the national curriculum, namely curriculum modification, in reinforcing science and technology capabilities with a typical curriculum in the boarding sector (Munadi et al., 2021). The school learning process is inspiring, fun, challenging, motivating, and interactive. It provides space to form creativity and independence according to students' interests, talents, and potential to support optimal growth and development (Syam et al., 2020).

Through the various explanations above, the researcher then intends to examine how the evaluation results in the teaching process of mathematics education are carried out in school X through the CIPP model.

B. LITERATURE REVIEW

1. Evaluation

Etymologically evaluation comes from English, namely evaluation from the root word value, which means value or price. Value in Arabic is called al-qiamah or al-taqdir', which implies assessment (evaluation). In Arabic, evaluation is known as imtihan which means test, and it is also known as khataman as a way of assessing the final result of the educational process. According to Stufflebeam, evaluation gives information that may be used to determine prices and services based on the achieved objectives, the implementation design, and the impact, in order to aid in decision-making, promote accountability, and increase understanding of the phenomenon (Tarigan et al., 2021).

The essence of evaluation, according to this concept, is to provide knowledge that can be used as a basis for decision making. Meanwhile, the National Study Committee on Evaluation defines evaluation as a process or activity that includes the selection, collection, analysis, and presentation of data that can be utilized to make decisions and plan future activities. According to another school of thought, specifically Brinkerhoff, evaluation is a procedure that establishes the extent to which educational objectives can be met (Sadeghi et al., 2022).

According to Brinkerhoff, seven elements must be done: determining the focus to be evaluated; preparation of evaluation design; information collection; analysis and interpretation of information; report generation; evaluation management; and evaluation for evaluation. In this sense, it shows that in conducting an evaluation, the evaluator at an early stage must determine the focus to be evaluated and the design

to be used. This means that there must be clarity about what will be evaluated, which implicitly emphasizes the purpose of evaluation and planning to conduct an evaluation (Wallo et al., 2020).

2. Learning

The learning process implements the lesson plan, which includes preliminary, core, and closing activities. Initial activities include psychological and physical preparation of students by the teacher to take part in learning, provide motivation, ask questions related to previous knowledge of the material to be studied, explain the objectives, and convey the scope of the material (Knopik & Oszwa, 2021). The instructor adapts models and approaches, media, and learning resources to the students' and subjects' qualities during the core activity. The concluding activity involves reflection on the entire sequence of learning activities, the outcomes, and the advantages of the learning outcomes. To determine the acquisition of learning outcomes, the teacher assesses student learning outcomes (Rapanta et al., 2020).

3. Mathematics

Mathematics is derived from the Latin term *Mathematica*, which was derived from the Greek term *mathematike*, which refers to knowledge relationships. The Greek word has the root word *mathema*, which means study, learning, science, or knowledge whose scope is narrowed, and its technical meaning is the study of mathematics. The term *Mathematique* is also associated with other terms, such as *Mathenein* or, in French, *les mathematiques*, which signifies mathematics (Miftah et al., 2022).

As a result of its roots, the term mathematics refers to knowledge acquired via the process of learning. Thus, mathematics is synonymous with knowledge. According to Abdurahman, mathematics is a symbolic language with the practical purpose of expressing numeric and spatial relationships and the theoretical purpose of facilitating thought. Meanwhile, according to Ruseffendi, mathematics is a science of regularities, the science of organized structures starts from elements that are not defined, to factors that are defined by axioms or postulates, and finally to propositions (Aprinastuti et al., 2020).

4. CIPP Evaluation Model (Context, Input, Process, and Product)

Stufflebean's review of the CIPP model can be applied in a variety of sectors, including education, management, and business, and at a variety of levels, including projects, programs, and institutions. In education, Stufflebean divides the educational system into four dimensions: context, input, process, and product, resulting in the CIPP model, which stands for context, input, process, and product. The four letters in the abbreviation CIPP stand for evaluation targets, which are nothing more than components of an activity program's process (Jumari & Suwandi, 2020).

a. Context Evaluation

Context evaluation is an evaluation of the readiness/availability of infrastructure for the learning process following the standards of the education process that have been set.

b. Evaluation of inputs

Evaluation of inputs is an evaluation of the implementation of learning plans according to the standards of the education process set previously.

c. Process evaluation

Process evaluation is an evaluation carried out when implementing the learning implementation plan that has been prepared.

d. Product evaluation or results

Product evaluation is a process that is used to determine the success of a product in accomplishing its objectives. The data collected will dictate whether the program is continued, adjusted, or canceled.

C. METHOD

This research will be conducted using an evaluative case study method using a qualitative approach. Through this method, an activity will be assessed against a predetermined benchmark. Research data obtained from various research results and previous studies are still relevant to this research. The research data that has been collected will be analyzed, and then conclusions from this research can be found.

D. RESULT AND DISCUSSION

1. Context Evaluation in Mathematics Learning

The first component of appraisal is context. This evaluation describes and identifies (enumerates) a problem, substance, and opportunity in order to assist decision-makers in mapping out the program's objectives and priorities, as well as to assist other users. The purpose of evaluating the context of mathematics learning is to ascertain whether the objectives of mathematics learning in school X have been met. The evaluation begins with the profile of the institution where mathematics is taught. At school X, there are six parallel classes at each grade level, with each class consisting of 25-27 pupils. Three teachers are employed in the field of mathematics studies. Teachers have a working knowledge of the 2013 Curriculum's content standards (SI), graduate competence standards (SKL), and guidelines for developing the 2013 Curriculum. Content standards (SI) define the scope of material that must be obtained or mastered by students, as defined in competency standards and essential competencies.

The objectives of mathematics instruction have been succinctly stated in the lesson plans. By gathering data and information from pupils, teachers can discover difficulties with mathematics learning. The application of mathematics learning follows the vision and mission, one of which puts forward the fields of science and technology. This is one of the fundamental roles of the teacher, namely as an evaluator.

In context, the questionnaire instrument's assertions were processed and analyzed using descriptive statistical methods, yielding an 85.37 percent response rate, which falls into the "Very Good" category.

2. Evaluation of Inputs in Mathematics Learning

The second evaluation is input evaluation. This review is being conducted to determine students' contributions to mathematics learning and the certification system's suitability for prospective students' requirements. Additionally, this evaluation is linked to the competences that educators possess during the learning process in order to assist in regulating decisions, determining available resources, which alternatives are chosen, and which plans and tactics are used to accomplish goals. School X students are students who have been selected for the new two paths, namely the regular path and the achievement path. The director-general of education manages the selection of recent student admissions under SNPDB. School X curriculum is the 2013 curriculum adapted to the school curriculum.

Thirdly, teaching materials at School X were chosen by the teacher and matched to the students' personalities and requirements, and are available in the library for independent study by students. Along with printed books, School X utilizes supplemental teaching materials such as student worksheets, PowerPoint presentations, and other mathematics-related literature. Fourth, the mathematics teacher in School X consists of 3 teachers. All teachers have a background in mathematics and mathematics education. The teacher has the experience and has attended training/upgrading.

Fifth, School X's facilities and infrastructure are school buildings (100%) owned by the Ministry of Religion and are still building and expanding. All classes are eligible and have met the spacious, clean, and already installed LCD and projector criteria. The results of the library room observations at School X showed that the room was adequate. The number of library visits is properly documented, and the amount of books supporting mathematics education in schools is adequate to meet the demands of teachers and pupils. When descriptive analysis was used to evaluate the input, a percentage of 90.67 percent was classified as "very good."

3. Process Evaluation in Mathematics Learning

Process evaluation is the third type of evaluation. Process evaluation is used to assess the implementation of the mathematics learning program created by the school. This process is also evaluated in terms of the curriculum, learning tools, learning models, learning facilities, and the way the learning process is implemented. The purpose of this study's process evaluation is to determine compliance with the learning implementation standards stated in the Process Standards mentioned in PP. 41 of 2007. Learning implementation is the process of implementing learning technologies. The process of implementing learning is divided into two stages: the needs phase and the learning implementation phase.

The first criterion for implementing learning is the number of study groups. Each study group at School X has approximately 25-27 members. This is in accordance with the requirements established by the Ministry of Education. The second is the teacher's workload being kept to a minimum. Numerous activities comprise the teacher's workload. These actions include planning for learning, implementing learning, assessing learning outcomes, guiding, training, and supervising pupils. Based on the data obtained, teachers at School X must always be on standby because the school is a boarding school where students have activities all day. At night, the teacher regularly fills in the guidance in the dormitory as a form of deepening the material. Learning planning begins with the development of learning instruments. The syllabus, lesson plan (RPP), annual program, semester program, time allocation distribution, and minimum completion criteria all serve as instructional resources for teachers (KKM).

The teacher's classroom management is appropriate before and during learning if it follows the model and learning method utilized and if it is consistent with the topic being taught. The implementation of learning can be said to be not good even though it has fulfilled the evaluation principle. Still, its implementation has not been following the planning. The requirements and implementation of mathematics learning at School X have met the completeness of the prerequisites and processes. Starting from the number of standardized study groups, teachers' workload is not too heavy, namely an average of 24 hours of lessons, a sufficient number of reference books, and complete and well-organized class management. The proportion of 73.3 percent was determined to be "Good" based on the research findings that were examined utilizing descriptive statistical methods.

4. Product Evaluation in Mathematics Learning

Fourth is product evaluation. The purpose of product evaluation is to assess student learning outcomes in the mathematics learning process and the sustainability of graduates from Elementary School X. The results of this evaluation will significantly determine the success or failure of learning mathematics in School X. Whether mathematics education should be continued in its current form or modified to meet the aims of mathematical education. The results (product) of this study are evaluated by determining if participants met their learning objectives on daily test tests, mid-semester tests, end-of-semester tests, and national exams.

According to data collected through interviews and documentation studies, the learning results of school X students, both on daily examinations and end-of-semester assessments (PAS), have met the classical minimum requirement of completeness. At school X does not carry out midterm exams like in other schools or schools. School X graduates 100% pass the national exam. 85% of students continue to well-known universities in Indonesia. Based on the data obtained using the descriptive method, school x scores 85.86% belonging to the "Very Good" category.

E. CONCLUSION

Conclusions can be reached based on the outcomes of data analysis and debate. The purpose of evaluating the context of mathematics learning is to ascertain whether the objectives of mathematics learning in School X have been met. As a result, there is alignment between the mathematical learning objectives and the school's vision and mission. Within this context, the analysis results determined the percentage of individuals who fall into the very good category. The evaluation of input assesses students' contributions to the learning process as well as educators' competency. The evaluation findings for the input are excellent. The evaluation of the mathematics learning process in School X entails assessing both the learning requirements and the implementation of the learning. The analysis results obtained the percentage belonging to the good category during the procedure (process). The product evaluation process assesses the teacher's instructional tools and the students' learning achievement at School X. The product evaluation is excellent.

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