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**OPTIMIZING MATHEMATICAL PROFICIENCY: INTEGRATING CAMBRIDGE AND NATIONAL CURRICULA IN MATHEMATICS EDUCATION****OPTIMASI KEMAMPUAN MATEMATIKA: INTEGRASI KURIKULUM CAMBRIDGE DAN NASIONAL DALAM PENDIDIKAN MATEMATIKA**Yuli Dwi Purnamawati\*<sup>1</sup><sup>1</sup>Universitas Negeri Jakarta, Jl. R. Mangun Muka Raya No.11, RT.11/RW.14, Rawamangun, Kec. Pulo Gadung, Kota Jakarta Timur, Daerah Khusus Ibukota Jakarta 13220, Indonesia<sup>1</sup>yulidwipurnamawati@gmail.com

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**Abstract:** As the primary education institution, ‘School X’ needs to plan a comprehensive and efficient curriculum. This comprehensive study critically evaluates the integration of the Cambridge and National Curricula, with a special emphasis on mathematics. Data collection techniques included interviews, observations, case studies, open questionnaires, and documentation. Open questionnaires conducted with teachers revealed their understanding of the integration of the Cambridge and National curricula. The methodology combines a detailed SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis with a case study approach. Surveys of both teachers and parents at the school capture a wide range of perspectives on the effectiveness, challenges, and benefits of integrating these curricula in mathematics. The impact of this integration on student performance, teacher efficacy, and educational equity in mathematics is also explored. The study's results, focusing on improved curriculum management, dedicated teacher development in mathematics, and ongoing assessment of mathematical competencies. This provides a foundational framework for effective curriculum management in a globally adaptive educational environment, specifically focusing on mathematics.

**Keywords:** Cambridge curriculum, curriculum integration, mathematics education

**Abstrak:** Sebagai pengelola lembaga pendidikan dasar, ‘Sekolah X’ perlu merencanakan kurikulum yang komprehensif dan efisien. Studi komprehensif ini bertujuan mengevaluasi integrasi Kurikulum Cambridge dan Kurikulum Nasional, dengan penekanan khusus pada matematika. Teknik pengumpulan data menggunakan wawancara, observasi, studi kasus, kuesioner terbuka, dan dokumentasi. Kuesioner terbuka dilakukan terhadap guru mengungkapkan pemahaman mereka terhadap pengintegrasian kurikulum Cambridge dan Nasional. Metodologi penelitian menggabungkan analisis SWOT (Strengths, Weaknesses, Opportunities, Threats) yang mendetail dengan pendekatan studi kasus. Survei kepada guru-guru dan orang tua di sekolah ini menangkap beragam pandangan mengenai efektivitas, tantangan, dan manfaat dari integrasi kurikulum ini dalam mata pelajaran matematika. Dampak dari integrasi ini terhadap kinerja siswa, efikasi guru, dan kesetaraan pendidikan dalam matematika juga dieksplorasi. Hasil studi ini berfokus pada manajemen kurikulum yang lebih baik, pengembangan guru matematika yang berdedikasi, dan penilaian kompetensi matematika yang berkelanjutan. Penelitian ini memberikan kerangka dasar untuk manajemen kurikulum yang efektif dalam lingkungan pendidikan yang beradaptasi secara global, dengan fokus khusus pada matematika.

**Kata kunci:** kurikulum Cambridge, integrasi kurikulum, pendidikan matematika

**Cara Sitasi:** Purnamawati, Y. D. (2023). Optimizing mathematical proficiency: Integrating Cambridge and national curricula in mathematics education. *Math Didactic: Jurnal Pendidikan Matematika*, 9(3), 552-567. <https://doi.org/10.33654/math.v9i3.2485>

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The crucial role of primary education in shaping the early academic and personal development of children is profoundly evident, particularly in the realm of mathematics. This foundational stage is pivotal in instilling key competencies and character traits in young learners, laying the groundwork for their future academic and professional pursuits. Mathematics, as a core subject, is fundamental to understanding and interpreting the world, playing a vital role in the development of logical reasoning, problem-solving skills, and analytical thinking. In a world that is increasingly interconnected and driven by technological advancements, the demand for education that meets international standards, while remaining adaptable to ongoing changes, has become increasingly significant. This global trend is evident in the growing preference among parents and societies for educational institutions that offer curricula meeting international standards, especially in mathematics, to prepare students as globally competent individuals.

The challenges faced by the primary education system in Indonesia, especially in the context of human development towards the golden generation of 2045 as planned by the Ministry of Education and Culture. It emphasizes the need for effective and efficient curriculum planning. The curriculum is viewed as a plan that is arranged to facilitate the teaching and learning process under the direction and responsibility of the school or educational institution and the existing teaching staff (Nasution, 2015). Among various international educational frameworks, the Cambridge curriculum has emerged as a frontrunner, celebrated for its comprehensive structure and a legacy steeped in educational excellence. The Cambridge approach, with its emphasis on skill development and alignment with specific learning objectives, is particularly effective for teaching mathematics. This methodology is essential for equipping students with the skills necessary to solve complex, real-world mathematical problems, preparing them for the challenges of the modern world. Assessment and Learning in the Cambridge curriculum are supported by direct advice from educational practitioners, providing an integrated coverage of the goals of Scientific Inquiry (Cross & Board, 2014).

This study delves into the integration of the Cambridge and national curricula at "School X," an anonymized elementary school that embraced this approach in 2014. The integration process at School X represents a deliberate alignment of diverse educational standards, with a particular emphasis on crafting a comprehensive and versatile learning environment for mathematics. This integration is crucial in mathematics due to the different content delivery methods and learning outcomes that characterize the national and Cambridge approaches to math education. According to Fuad (2015), the curriculum structure is the pattern and arrangement of subjects that students must undergo in learning activities with the depth of curriculum content in each subject. So, this study presents a comprehensive study using qualitative research methods, including in-depth interviews, classroom observations, and questionnaires, to examine the effectiveness, challenges, and benefits of this curriculum integration.

The study aims to provide valuable insights into effective curriculum integration management, particularly highlighting the influence on mathematical proficiency. The goal is to assess the broader educational impact of developing well-rounded, globally aware individuals who are proficient in mathematics. By investigating the case of School X, the study makes significant contributions to the growing body of knowledge in curriculum development. It particularly focuses on the integration of international and national educational frameworks, with an emphasis on mathematics education. It also underscores how strategic curriculum integration can enhance mathematical understanding and

competency in young learners, preparing them for the complex demands of a globalized and technologically advanced society. So, the objective of this study including: (1) planning, (2) organizing, (3) implementation, and (4) evaluation of the integration of the Cambridge and National Curricula.

Many comparative studies show how to analyze the Cambridge Curriculum against various national curricula. Cambridge primary education system is influenced by factors such as subject-oriented, teacher-centered, and exam-oriented and therefore has not had much success in creative education (Samiee et al., 2022). Research on the Cambridge curriculum has been extensively conducted in Indonesia, but this study brings a novelty by exploring the integration of the Cambridge curriculum and the National curriculum in more depth. In formulating the state of the art, this study is based on six recent studies conducted in the last five years. The research by Nafisah (2018) and Widjanarko & Budiyo (2018) focuses on the implementation of the Cambridge curriculum, revealing challenges faced by teachers and students. Meanwhile, Sari & Mundilarno (2020) and Sinaga et al. (2021) discuss the management of the Cambridge curriculum more broadly. Although the four studies provide perspectives on the advantages of the Cambridge curriculum, this study is unique because it examines the management of the integration of both curricula in schools. Different from the research by Hasanah (2019) and Aryaningsih & Rejokiriono (2022), which also focus on the integration of both curricula but lack detail in the data analysis methodology, this study applies a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis to comprehensively assess curriculum planning.

Overall, this study provides a comprehensive examination of the integration of the Cambridge and national curricula in mathematics education at School X. It presents a model for other educational institutions aiming to merge different educational frameworks to enhance mathematics education. The insights gained from this study are crucial for educators and policymakers seeking to navigate the complexities of curriculum integration in mathematics, aiming to foster a generation of students who are not only mathematically skilled but also globally minded and adaptable to the rapidly evolving educational landscape.

## Methodology

The methodology of "Optimizing Mathematical Proficiency: Integrating Cambridge and National Curricula in Mathematics Education" is grounded in a qualitative research design, utilizing a case study approach that is particularly effective in providing a comprehensive and contextual understanding of the complexities involved in curriculum integration, with a focus on mathematics education. Qualitative research is defined as research that produces data in the form of written or oral narratives, obtained from the observation of behavior or statements of subjects (Bogdan & Taylor, 1990). This approach is pivotal in unraveling the multifaceted dynamics of combining the Cambridge and National Curricula within a real-life educational setting, offering insights into the specific challenges and opportunities encountered in the realm of mathematics. The steps taken in the case study design in this research are show in Table 1.

**Table 1. Number of Steps for A Case Study Approach in this Study**

No	Steps	Description
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1	Formulation of Research Questions	<ul style="list-style-type: none"> <li>- What is the goal of integrating the Cambridge curriculum with the national curriculum in mathematics?</li> <li>- How is curriculum planning conducted at School X?</li> <li>- How is the integration curriculum organized between the Cambridge Curriculum and the National Curriculum at School X?</li> <li>- What are the forms of good curriculum implementation in the context of integrating the Cambridge curriculum in mathematics?</li> <li>- How is the evaluation of the integrated curriculum between Cambridge and National at School X conducted?</li> <li>- What are the benefits and challenges faced in the integration of the curriculum?</li> </ul>
2	Theoretical Framework	<ul style="list-style-type: none"> <li>- Literature review related to the integration of the Cambridge curriculum with the national curriculum, both in Indonesia and in other countries.</li> <li>- Previous studies on the experiences of other schools that have integrated the curriculum.</li> <li>- Review of educational theories and theoretical frameworks relevant to the research.</li> </ul>
3	Research Subject	Identification of research participants, such as teachers, and parents at School X.
4	Data Collection	<ul style="list-style-type: none"> <li>- Conducting interviews with the principal, vice-principal in charge of curriculum, and teachers involved in curriculum integration.</li> <li>- Direct observation in the classroom to see the implementation of curriculum integration.</li> <li>- SWOT analysis related to the curriculum management applied at the school.</li> </ul>
5	Data Analysis	<ul style="list-style-type: none"> <li>- Transcription of interviews and observations.</li> <li>- Identification of main themes and patterns emerging from the collected data.</li> <li>- Coding for the purpose of data reduction is based on the main objective of this study.</li> </ul>
6	Conclusion	Conclusions that summarize the main findings of the research.

Participants in this study include key figures at School X, such as the principal, vice-principal (in charge of curriculum management), and twenty-six teachers who are directly involved in the practical application of the integrated mathematics curriculum. Their selection was based on their direct involvement and comprehensive experience with the integrated curriculum, particularly in mathematics, ensuring that the collected data are both relevant and insightful. The data sources referred to by Tyler (2013) are Students' needs and interests, curriculum developers identify potential objectives by researching the needs and interests of students, and analysis of contemporary life in local environments and society on a larger scale is the next step in formulating general objectives, from the needs of society, many potential educational objectives emerge, and subjects. School X, chosen for this study, represents a unique case of successfully integrating both the Cambridge and National Curricula, making it an ideal site for research. This school exemplifies the fusion of international and national educational standards in mathematics, offering a rich context for examining the practical implications, challenges, and achievements of integrating these curricula. The decision by School X to blend these curricula, particularly in mathematics, provides a fertile ground for an in-depth analysis of curriculum integration's impact on mathematical understanding.

Data collection for this study is multifaceted, consisting of three main components: (1) In-depth interviews with the principal, vice-principal, and teachers, focusing on their experiences and perceptions regarding the mathematics curriculum integration. These semi-structured interviews, lasting approximately 45-60 minutes each, are designed to strike a balance between focused and open-ended questions, facilitating candid discussions in conducive environments. (2) Classroom observations, conducted over a period of three months, with each observation session lasting around two hours. These observations are essential for directly assessing how the integrated mathematics

curriculum is implemented in classroom settings. They provide firsthand insights into the teaching methodologies, student engagement, and application of mathematical concepts, with detailed notetaking capturing the nuances of these interactions. (3) Comprehensive questionnaires distributed to teachers and parents, composed of both closed and open-ended questions, aim to gather a broad spectrum of quantitative and qualitative insights on the impact and areas for improvement of the integrated mathematics curriculum.

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This methodological framework is integral in ensuring the study's credibility and validity. By triangulating data from various sources and employing multiple analysis methods, a comprehensive view of mathematics curriculum integration at School X is achieved. This robust approach underscores the reliability of the findings and their potential applicability in understanding similar curriculum integration efforts in other educational contexts, especially in mathematics.

Ultimately, this research aims to provide actionable insights and recommendations to enhance the quality of mathematics education, not only at School X but also at other institutions considering the integration of diverse curricula. The goal is to create a mathematics education experience that is robust, holistic, and responsive to the demands of a globalized world, emphasizing the optimization of mathematical proficiency through integrated curricula.

## **Results and Discussion**

The research conducted at "School X," an anonymized elementary school that integrates Islamic education with both high-quality national and international (Cambridge) curricula, offers a unique lens into mathematics education within a multicultural and multi-curricular context. This educational setting is distinctive for its commitment to academic excellence, strong Islamic values, and the objective of nurturing students to make substantial contributions to their communities. The school's approach is characterized by an educational constructive collaboration that unites academic rigor, deep-rooted Islamic teachings, and a global perspective, with a particular emphasis on mathematics, a subject increasingly recognized as vital in the modern world.

The methodology of this study, encompassing in-depth interviews, classroom observations, and questionnaires, was intricately designed to capture the complexities of integrating the Cambridge



and National Curricula in mathematics education. The data gathered from various stakeholders at School X, including teachers, the principal, and vice-principal, yielded detailed insights into the nuances of this curriculum integration, especially as it relates to the teaching and learning of mathematics.

A primary outcome of the study was the evident success of integrating the Cambridge Mathematics Curriculum with the National Curriculum. Teachers at School X viewed this integration as a major strength, commending its comprehensive approach to mathematics education that effectively blends international mathematical standards with the national curriculum's focus on local context and Islamic values. Teachers reported notable improvements in students' mathematical understanding and problem-solving capabilities, crediting the integrated curriculum's breadth and diversity.

Despite these successes, challenges in implementing the integrated mathematics curriculum were identified. Teachers called for more specialized training and resources to effectively teach the combined curriculum. They emphasized the necessity of a tailored Daily Lesson Plan (DLP) to meet the unique requirements of teaching mathematics in an integrated educational framework, balancing the rigor of the Cambridge Mathematics Curriculum with the nuances of the National Curriculum and Islamic principles.

In the book titled *How to Integrate the Curricula*, the concept of curriculum integration is intended to transform teaching and learning activities into the daily activities of students so that they can be easily applied anywhere (Fogarty & Pete, 2009). A key finding is that the integration, particularly in mathematics subjects aligned with the Cambridge Curriculum, has been largely successful. Teachers have demonstrated a robust understanding and effective utilization of the Cambridge Mathematics Curriculum resources, indicating a successful adaptation. However, the study also identifies areas needing improvement, such as broader application of the curriculum and enhancement of certain management strategies in mathematics education.

Parents generally perceive the quality of mathematics education positively, valuing the comprehensive approach that combines global standards with national relevance. Yet, challenges related to curriculum structure, workload management, and strategic implementation in mathematics education were also noted.

Parental feedback added another dimension to the study. Parents of students at School X recognized the significant role the integrated curriculum played in enhancing their children's mathematical abilities, applicable in both local and global contexts. They observed an increase in their children's competence in tackling complex mathematical problems and a boost in their confidence in handling mathematical challenges. However, parents also expressed the need for more hands-on, experiential learning opportunities in mathematics, such as practical laboratory work and real-world problem-solving tasks, to further solidify their children's mathematical skills.

This research underscores the transformative potential of curriculum integration in elevating the standard of mathematics education. The fusion of the Cambridge and National Curricula at School X has established a platform for students to not only excel in mathematics but also to connect their learning to their local and Islamic cultural roots. The insights gained from this study emphasize the criticality of ongoing enhancements in curriculum planning and implementation, particularly in specialized subjects like mathematics. This ongoing refinement process is imperative for School X

and similar institutions striving to provide a balanced, rigorous, and culturally relevant mathematics education, equipping students to succeed in an increasingly interconnected and globalized world.

### **Curriculum Planning**

There are various levels in curriculum planning, starting from Classroom level, Team/grade/department level, Individual School Level, School District level, and State level (Oliva, 1988). The curriculum planning at School X, as expressed by the principal, is conducted with a comprehensive approach that encompasses various elements, starting from the teachers' 'lesson plan' to the syllabus analysis. It was added that the school also compiles a "Yearly Overview" those functions as a roadmap or blueprint for the learning process throughout the year. Both sources emphasize that well-thought-out and structured planning is a crucial element for success in implementing curriculum integration.

According to the Vice Principal, there are several important aspects that are the focus of the curriculum planning process at this school. One of them is the evaluation of the curriculum weight, which considers factors such as the duration of study per week, the number of meetings per semester, and the total meetings in an academic year. The goal is to ensure that each material or topic is taught with the right time proportion and in accordance with the plan. So, School X has a discipline model type which is planning focuses on the teacher. The discipline model plan the curriculum based on systematic considerations of the relevance of philosophical, sociological, and psychological knowledge (Nasbi, 2017).

### **Organizing Curriculum**

Almost all National Curricula serve only as a legal basis for an educational institution, while schools need to be accountable in determining their own curriculum (Colwill & Peacey, 2001). The principal stated that the process of organizing the curriculum at School X involves considering the weight of each subject from both the Cambridge Curriculum and the National Curriculum. Although there is variation in the allocation of time for certain subjects, the school is committed to ensuring that each subject receives the appropriate and balanced weight. The Vice Principal emphasized this point, adding that the school's efforts are not only to create a balance in the application of both curricula but also to ensure that no one curriculum dominates the other.

Furthermore, in the organization of the curriculum at School X, there is a special effort to integrate the Cambridge Curriculum and the National Curriculum so that they complement and balance each other. One factor influencing this decision is the government policy that has eliminated school exams, giving schools more flexibility in the application of the Cambridge Curriculum. This allows the school to better optimize its human resources and pedagogical approaches, without feeling constrained by the need to prepare students for national standardized tests. Therefore, the school focuses on a balanced implementation of both curricula to provide a holistic education to the students.

### **Curriculum Implementation**



One crucial factor in curriculum implementation is teacher involvement. Teachers must have a deep understanding of the curriculum and how to apply it. The success of teachers in curriculum implementation indicates an elevated level of quality and adaptive learning to student needs. Curriculum integration provides ICM students with greater opportunities to excel, not only in the school environment but also in various extracurricular or academic competition arenas. Furthermore, this integration also paves the way for School X to expand collaboration with other educational communities, both nationally and internationally, to share best practices and resources.

The curriculum implementation at School X falls into a good category. The stability and consistency of the curriculum are proven. Nevertheless, there is a need for improvement, especially in human resources. Success in detailing the process of curriculum development and implementation has been noted, but there is an identified need to enhance the management of student diversity so that every student receives appropriate education.

In addition, the school also pays attention to additional activities or events that, although not related to the curriculum, still play a significant role in learning. Examples of these activities include Market Day, Performance Day, and Field Trip activities. These activities are more focused on developing students' practical skills, not just cognitive knowledge. They serve as living laboratories, where students can apply and practice what they have learned in a more realistic setting. Thus, even though they may not seem related to the curriculum, these activities hold an especially significant role in supporting holistic and integrated learning. However, the leadership process is particularly important in curriculum planning (Rissanen, 2021).

### **Evaluation and Monitoring**

The principal also emphasizes the importance of continuous evaluation of teacher performance, covering aspects of interaction, communication competence, as well as initiative and adaptability. Furthermore, the evaluation must consider the extent to which curriculum planning is effectively implemented in the field. The Vice Principal acknowledges the success of teachers in curriculum implementation, indicating a prominent level of quality and adaptive learning to student needs.

To enhance the effectiveness of monitoring, the first product of the curriculum evaluation becomes foundational. The first product is usually an initial or baseline report that describes the current condition of curriculum implementation. This report can include various elements, such as student achievement assessment, feedback from teachers and students, and other relevant data. Having the first product makes it easier to determine priorities. Next, the capability of teachers becomes the main focus of the evaluation. The following step involves conducting a more in-depth analysis of the topics taught. Graduate Learning Outcomes (CPL) will be provided to the quality control of this school. CPL is also an integration of core competencies and essential competencies that are comprehensively arranged, covering a set of competencies and the scope of material, which are formulated based on the graduate profile into the standards of graduate competencies.

### **SWOT Analysis**



SWOT analysis is a method of analysis that can be used to assess and evaluate the 'strengths,' 'weaknesses,' 'opportunities,' and 'threats' existing in an organization, plan, project, individual, or business activity (Namugenyi et al., 2019). A significant revelation from the research at School X was the recognition of the integration of the Cambridge and National Curricula as a major strength by the majority of the teaching staff. This acknowledgment reflects the school's dedication to providing a holistic education that encompasses a global perspective. However, the study also uncovered areas in need of improvement, particularly in the realm of curriculum implementation. While the overall curriculum planning received positive feedback from teachers, there was a noted desire for increased involvement and contribution from them in the planning process. Many teachers expressed the view that the Daily Lesson Plan (DLP) could be better tailored and optimized to align with the specific needs and learning objectives of the students more closely.

From the parental perspective, there is a positive perception regarding the quality of education provided and the benefits stemming from the integration of these curricula. Parents recognize the value of providing a comprehensive education that combines global standards with national relevance. However, alongside these positive responses, the study uncovers challenges related to curriculum structure, workload management, and the strategic implementation of integrated curricula. Parental feedback constituted a critical component of this study. Parents of School X graduates generally offered positive reviews of the integrated curriculum, lauding its role in helping students grasp and appreciate both global and local educational contexts, thereby preparing them for future international educational endeavors. However, they also proposed areas for enhancement, such as augmenting teacher training programs, advancing the practical application of knowledge, improving the use of laboratories for more experiential learning, developing contextually relevant teaching methods, and upgrading the school's facilities. These suggestions are targeted toward elevating the overall quality of education at School X. The full analysis of Strengths, Weaknesses, Opportunities, and Threats (SWOT) will be provided in [Table 2](#).

Mathematics education plays a crucial role in shaping students' cognitive abilities and problem-solving skills. It is a fundamental subject that not only equips students with mathematical knowledge but also fosters critical thinking, logical reasoning, and the ability to analyze complex problems. Effective math education is essential for preparing students to succeed in various academic and real-world contexts. In a recent interview with mathematics teachers at School X, several key insights regarding the understanding and application of the Cambridge curriculum, curriculum integration, and teaching practices were gathered. The teachers' years of experience in the range of 1-5 years were discussed, with all of them expressing a good understanding of the Cambridge curriculum framework and the use of provided teaching tools such as Teacher Resources, Students Book, and Activity Book.

However, it is worth noting that none of the interviewed teachers had participated in Cambridge training or received Cambridge certification. In terms of curriculum integration, they generally agreed that integration at School X aligns well with the school's vision, mission, institutional goals, and profile. The advantages of this integration included good curriculum planning and structure. Still, there were challenges in the incomplete implementation of integration and unsatisfactory graduate learning outcomes.

**Table 2. SWOT Analysis of Curriculum Management at School X**



Category	Strengths	Weaknesses	Opportunities	Threats
<b>Planning</b>	Successful integration of the Cambridge and National Curricula is the result of the school's holistic and inclusive policy.	The level of parent and teacher participation could be a barrier.	The community responds well to the vision, mission, and goals of the school.	Curriculum structure and workload setting are not yet well-measured.
<b>Organization</b>	Very adequate supporting facilities.	Issues with high teacher turnover rates.	Opportunities to expand collaboration with other educational communities.	High teacher turnover rates.
<b>Implementation</b>	Education at the school becomes more balanced and comprehensive.	Some students struggle to understand and master the material from the Cambridge curriculum due to English language limitations.	Opening opportunities to cooperate and share best methods and resources.	Continuous dynamics of change in the National Curriculum.
<b>Evaluation</b>	The level of graduate learning achievements is generally satisfactory and shows the effectiveness of the evaluation methods used.	Although achievement levels are satisfactory, there is room for improvement, especially in certain aspects that are not fully satisfactory.	Identifying and focusing efforts on aspects that require improvement can be an opportunity to optimize graduate quality.	Grand expectations from parents or other stakeholders can be a threat if the evaluation methods are not accepted or doubted in their effectiveness.

Regarding curriculum planning, there was a consensus that it needs improvement, particularly in terms of involving teachers and creating a measurable curriculum structure, teaching load, and academic calendar. Some teachers provided suggestions for improving the curriculum planning process, such as specific and deeper training on integrating both curricula. They also highlighted supportive teaching activities like Circle Time, Dear Time, Reading Program, and Prayer Time.

The teachers recognized the benefits of curriculum integration but acknowledged the need for improvements in planning, teacher involvement, and curriculum structure. They also highlighted the importance of regular training for teachers and the need to adapt the curriculum to meet the needs of students more effectively. Overall, this interview provided valuable insights into the challenges and opportunities of implementing the Cambridge curriculum at School X. The training conducted has not been able to understand teachers as the spearhead in the region to implement the curriculum (Purnomo, 2015).

Incorporating the Cambridge curriculum framework into math education can offer several advantages. The Cambridge approach emphasizes a deep understanding of mathematical concepts and encourages students to apply their knowledge to practical situations. This approach aligns with modern educational theories that emphasize active learning and the development of higher-order thinking skills.

One of the key benefits of the Cambridge curriculum is its focus on providing comprehensive teaching tools, including Teacher Resources, Students Book, and Activity Book. These resources can enhance the teaching and learning experience, making math education more engaging and effective. Moreover, the Cambridge curriculum provides a structured framework that helps educators plan their lessons and assessments systematically.

However, as highlighted by the teachers in the interview, successful implementation of the Cambridge curriculum in math education requires careful planning and continuous professional development. Training opportunities for teachers should be prioritized to ensure they are well-equipped to deliver high-quality math instruction. Additionally, curriculum planning should involve collaboration between teachers and education administrators to create a cohesive and effective learning environment.

Incorporating creativity into math education is another essential aspect. While math is often seen as a subject focused on rules and procedures, fostering creativity in math can make the subject more enjoyable and relatable for students. Encouraging students to explore mathematical concepts through problem-solving, group activities, and real-world applications can spark their curiosity and enthusiasm for the subject. Furthermore, the assessment of math education should be designed to measure not only procedural skills but also conceptual understanding. A well-balanced assessment approach that includes formative and summative assessments can provide a more comprehensive picture of students' mathematical abilities. The process of the identification of main themes and patterns emerging from the collected data by coding for the purpose of data reduction is based on the main objective of this study will show in [Table 3](#).

## ***Discussion***

The research conducted at School X, specifically focusing on the integration of the Cambridge and National curricula in mathematics education, illuminates a complex dynamic that both aligns with and diverges from existing educational curriculum integration theories and research. In the theoretical realm, there is a strong emphasis on participatory approaches, advocating for active stakeholder engagement, particularly teachers, in curriculum planning and execution. This approach stems from the belief that such involvement is vital for the successful implementation of educational programs. However, at School X, the findings indicate a notable deviation in this regard, especially in the context of mathematics education.

At School X, while the integration of the Cambridge and National mathematics curricula has been generally successful in enhancing the students' mathematical skills and knowledge, the limited involvement of teachers in the planning phase stands out as a significant contrast to the theoretical ideal of participatory curriculum development. This limited involvement suggests a potential area for improvement, highlighting the need for more inclusive and collaborative approaches in the development of mathematics curriculum, in line with educational literature.

The experiences and challenges at School X in integrating these curricula in mathematics offer valuable insights for policymakers and educators. The need for ongoing professional development for teachers, as revealed by the study, is a critical factor in managing integrated curricula. This points to the essential role of continuous training and support in equipping educators with the necessary



skills and knowledge for effective teaching in an integrated educational environment, especially in a subject as critical as mathematics.

**Table 3. Data Reduction Based on the Main Objective of this Study**

Category	Curriculum Goal	Source	Topic
Planning	Curriculum Objective	Principal Interview	Curriculum Integration Objective
Planning	Training and Programs	Principal Interview	Professional Training and Development
Planning	Curriculum Balance	Principal Interview	Balance and Integration
Planning	Targeted Learning	Vice Principal Interview	Structured Learning
Planning	Curriculum Weight	Vice Principal Interview	Skill-Based Learning
Planning	Involve Teachers	Teacher Interview	Teacher Participation
Planning	Material Distribution	Teacher Interview	Curriculum Adaptation
Planning	Teaching Task Distribution	Teacher Meeting Minutes	Teaching Load Management
Planning	Lesson Load	Curriculum Documents and Schedule	Appropriate Learning Load
Planning	Graduate Learning Outcomes (CPL)	Academic Evaluation Report	Learning Achievement
Planning	Integration Understanding	Parent A Interview	Integration Awareness
Planning	Flexibility Expectations	Parent A Interview	Responsive and Flexible
Planning	Competency Standards	Documentation Study	Clarity of Educational Standards
Planning	Learning Strategy	Teacher Meeting	Learning Strategy Adjustment
Planning	Integrative Approach	Curriculum Planning Document	Learning Approach
Planning	Learning Strategy	Planning Field Notes	Learning Style Adaptation
Planning	Educational Calendar	Educational Calendar Document	Learning Time Effectiveness
Organizing	Task Division	Classroom Observation	Efficiency in Task Division
Organizing	Schedule Adjustment	Teacher Interview	Schedule Flexibility
Organizing	Structure and Weight	Principal Interview	Integrated Curriculum Structure
Organizing	Balance	Vice Principal Interview	Academic and Non-academic Balance
Organizing	Curriculum Structure	Teacher Interview	Assessment and Revision of Structure
Organizing	Lesson Load	Teacher Interview	Appropriate Lesson Load
Organizing	Support and Communication	Parent A Interview	Effective Communication
Organizing	Involving Parents	Parent B Interview	Parent Participation
Organizing	Classroom Management	Classroom Observation	Collaboration in Classroom Management
Organizing	Mastery of Teaching Material	Classroom Observation	Teacher Competency Improvement
Organizing	Class Structure	Organizing Field Notes	Learning Optimization
Implementation	Application in Classroom	Field Notes	Classroom Curriculum Integration Practices
Implementation	Material Use	Field Notes	School Activity and Material Integration
Implementation	Integration	Principal Interview	Collaboration and Training
Evaluation	Teacher Feedback	Vice Principal Interview	Feedback for Improvement
Evaluation	Graduate Learning Outcomes	Teacher Interview	Success and Challenges
Evaluation	CPL suitability	Teacher Interview	Contextualization of Learning
Evaluation	Student performance assessments.	Teacher Interview	Diverse Assessment Methods
Evaluation	Children's individual development.	Parent C Interview	Discussion of Child Development
Evaluation	Further teacher training	Teacher Meeting	Teacher Training

However, it is essential to consider alternative interpretations and be aware of the limitations of the study. The observed limited teacher involvement in mathematics curriculum planning, though identified as a gap, might also reflect the specific administrative dynamics of School X. Additionally, the overall satisfaction among teachers, despite their limited role in planning, could indicate trust in the school's leadership and governance, particularly in their approach to mathematics education.

The limitations of the study, particularly related to the qualitative methods like interviews and questionnaires, should be considered. Factors like respondent subjectivity, potential biases, and the limitations of self-reported data might have influenced the findings. The reliance on questionnaires, while useful, may not fully capture the intricacies of curriculum integration in mathematics, suggesting a need for more detailed and diverse data collection methods in future research.

This study adds significantly to the discourse on curriculum integration, particularly in mathematics education. It sheds light on the practical challenges and opportunities in integrating

diverse curricula and highlights the need for adaptive and flexible management strategies in mathematics education. These findings are particularly relevant in the context of globalized education, emphasizing the need to tailor curriculum development to meet diverse student needs.

In conclusion, the findings from School X, when placed within the theoretical and research frameworks, provide crucial insights into the practice of curriculum integration in mathematics. These insights contribute to the ongoing dialogue in educational research, underlining the importance of continued exploration and refinement in curriculum integration practices. Future research could focus on longitudinal studies to assess long-term effects on student outcomes in mathematics and investigate effective methods for enhancing stakeholder involvement in the mathematics curriculum development process. The first important opportunity identified is the possible development of skills that the students will benefit from in other subjects and society (Humble & Mozelius, 2019).

### Conclusions

This research, focusing on the integration of the Cambridge and National curricula at "School X," an anonymized elementary school, specifically in the context of mathematics education, provides a thorough exploration of the intricacies involved in melding different educational frameworks. The goal was to gain a deep understanding of both the triumphs and challenges encountered in this integration, aiming to establish a replicable and effective model for similar educational settings.

The successful integration of the Cambridge mathematics curriculum with the National curriculum at School X represents a major milestone in educational innovation. This integration adeptly balances global educational standards with local needs, particularly in mathematics, a subject integral to critical thinking and problem-solving skills. The teaching staff at School X has positively embraced this fusion, recognizing its significance in delivering an education that is globally informed yet locally tailored to mathematics education. Despite these achievements, the study identifies areas needing improvement, such as enhanced teacher participation in the mathematics curriculum planning and more refined Daily Lesson Plans (DLPs) to cater to diverse student learning styles in mathematics.

Feedback from both teachers and parents has been crucial in pinpointing the strengths and areas requiring attention within the integrated mathematics curriculum. Parents acknowledge the curriculum's role in equipping students with skills to navigate mathematical challenges in varied contexts. Nevertheless, there is a call for stronger teacher training programs in mathematics and better-equipped facilities to foster a more conducive learning environment for mathematics.

A SWOT analysis forms a pivotal part of this study, shedding light on various aspects of mathematics education at School X. The high accreditation score of the school is a testament to the quality of its mathematics education. Challenges identified include hurdles in understanding complex mathematical concepts from the Cambridge curriculum and a notable rate of teacher turnover. Opportunities for growth highlighted include strengthening connections with the broader educational community for mathematical development and preparing students for success in mathematics at both national and international levels. The study also recognizes potential threats, such as the challenges of an English-dominant learning environment and the intense competition in the educational sector, which may impact the delivery and reception of mathematics education.



This provides a nuanced understanding of the dynamics involved in merging two distinct educational frameworks, particularly as they pertain to mathematics education. The study investigates the integration process of the Cambridge and National Curricula and its implications on the quality and management of mathematics education. The analysis underscores a generally positive perception among teachers about the integrated mathematics curriculum's planning and execution. However, it also highlights the necessity for improvements in areas like lesson planning, evaluation of mathematics learning outcomes, and specialized teacher training in mathematics.

The study suggests future research paths, including investigations into the long-term impacts of curriculum integration on students' mathematical outcomes. Future studies could benefit from including a broader spectrum of respondents, particularly students, to gain a more holistic view of the integration's effectiveness in mathematics education. Additionally, assessing the efficacy of specific teacher training programs in mathematics and adapting curriculum planning to different educational contexts could provide deeper insights and practical guidelines.

The findings underscore the feasibility and benefits of blending different educational frameworks to enhance mathematical proficiency, which is critical in today's globally connected and technologically advanced society:

1. **Model for Curriculum Integration:** The successful integration at School X serves as a replicable model for other educational institutions looking to combine international and national curricula. The approach taken by School X, particularly in balancing global standards with local educational needs and cultural values, can guide schools in similar contexts.
2. **Teacher Training and Development:** The study highlights the importance of specialized teacher training for effective curriculum integration. Educational policymakers and curriculum developers can use these insights to design more targeted professional development programs, ensuring teachers are well-equipped to handle the complexities of integrated curricula.
3. **Curriculum Management Strategies:** The research provides a detailed account of managing and implementing an integrated curriculum. Schools and educational authorities can leverage these strategies to enhance their curriculum management systems, especially in subjects like mathematics that require a balance of conceptual understanding and practical application.
4. **Enhancing Educational Equity:** The integration of these curricula also addresses educational equity, offering a comprehensive education that is accessible and relevant to diverse student populations. This aspect is particularly valuable for educational researchers and practitioners striving to create inclusive learning environments.
5. **Future Research Directions:** The study opens avenues for further research, particularly in assessing the long-term impacts of such integrative approaches on student learning outcomes. It also provides a foundation for comparative studies to explore different methods of integrating curricula in various educational settings.
6. **Policy and Decision Making:** For policymakers, the findings offer a basis for informed decision-making regarding curriculum development and reform. The insights gained from School X's experience can assist in shaping policies that support effective curriculum integration, catering to the evolving needs of students in a global educational landscape.

In conclusion, the integration of curricula at School X, especially in mathematics, serves as a valuable model for educational institutions aiming to merge global and local educational standards in mathematics. The study's recommendations, focusing on improved curriculum planning, dedicated teacher development in mathematics, and ongoing assessment of mathematical competencies, are pivotal for schools striving to offer a comprehensive and well-rounded mathematics education. School X's journey through the various stages of mathematics curriculum integration offers insightful lessons for the wider educational community, highlighting effective strategies for managing changes in mathematics curricula.

The article emphasizes the synergies and challenges in aligning the Cambridge framework with national standards in mathematics. This research not only illuminates the unique case of School X but also extends its implications to broader mathematics education practices in diverse educational settings. It makes a significant contribution to both the theoretical and practical aspects of mathematics curriculum integration, providing invaluable insights for educational institutions navigating similar paths in the evolving landscape of global education.

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