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Comparative Study of Mathematics Education in Indonesia, Singapore and England (United Kingdom)

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Abstract:

This comparative study of mathematics education in Indonesia, Singapore and England aims to analyze the differences and similarities in three main aspects, namely the mathematics learning curriculum, evaluation system and teacher recruitment. This research examines how mathematics curricula in these three countries are structured to meet the educational needs of the 21st century, with a focus on developing critical thinking and problem-solving skills. In Indonesia, the mathematics curriculum is often more oriented towards achieving national standards, whereas in Singapore and the UK, the curriculum tends to be more flexible and based on holistic development of student competencies. In terms of the evaluation system, Indonesia relies on national exams and standards-based tests, while Singapore and the UK use a more diverse approach, including competency-based evaluations and formative assessments. Finally, in terms of teacher recruitment, Indonesia still faces challenges in ensuring the quality and number of teaching staff meet standards, while Singapore and the UK have strict selection systems and focus on developing teacher professionalism through continuous training. It is hoped that the results of this study will provide insight into the development of mathematics education policy in Indonesia, as well as enrich understanding of best practices applied in other countries.

Keywords: Mathematics Education, Curriculum, Indonesia, Singapore, England

INTRODUCTION

Education plays a role role crucial in shaping the quality of human resources a country. System effective education can have an impact significant to global competitiveness, especially in the fields of science, technology, and mathematics (Isnaeni et al., 2023). One of the indicators that are often used for assessing the quality of education a country is the result of the Program for International Student Assessment (PISA). PISA is an international survey that assesses the abilities of 15-year-old students in reading, mathematics, and science, with focus on their ability to apply knowledge in situations life real (Pakpahan, 2016). The eighth PISA test was attended by 81 countries with a total of 690,000 participants. They represent 29 million students aged 15 years, who are in secondary school from OECD countries and participants (OECD, 2023). In the 2022 edition of PISA, Indonesia ranked bottom in mathematics ability, while Singapore consistently ranked first, and the UK occupied a strong middle position.

The low PISA results in Indonesia are largely due to the lack of emphasis on problem solving and practical applications in mathematics teaching. In the context of PISA 2022, the OECD-set value standards for mathematics is 472 while Indonesia's score for mathematics is 366 (OECD, 2023). This shows that Many Indonesian students have difficulty understanding basic mathematical concepts and apply them in context life real (Guntur, 2015). Several factors that influence the low score includes inequality in access to education, varying quality of teaching, and limited training for teachers. Indonesia is committed to for improving the quality of education through various policy reforms and initiatives, including curriculum improvements and increased teacher training. Although Indonesia's achievements in PISA 2021 are still not significant increased, the Indonesian government showed existence steps towards improvement, especially in areas that have been implementing more innovative educational programs.

Singapore is known as one of the countries with system best education in the world, especially in mathematics. Singapore's mathematics curriculum is designed for develop thinking logic, problem solving, and creativity. The famous "Singapore Math" approach in a way international uses visualization-based methods such as model diagrams to help students understand draft abstract. The results of PISA 2022 show that Singaporean students achieve an average score of 575 in mathematics, ranking the country first in the world (OECD, 2023). This success is not only due to the quality of the curriculum, but also thanks

to major investments in teacher training, the use of technology in learning, and a competitive learning culture.

United Kingdom has system more flexible education with focus on development skills critical and analytical. The national curriculum in United Kingdom includes a variety of approaches mathematics teaching, from project-based learning to the use of technology for support teaching. United Kingdom also emphasizes the importance of quality teacher training and development professional sustainable. In PISA 2018, the UK achieved an average score of 489 in mathematics, slightly above the OECD average (OECD, 2023). The UK showed commitment to innovation education with integrating digital learning and promoting collaboration between school and community.

This research is important because it provides a comparative overview about approach mathematics education in three countries with different contexts and challenges. This research supports effort for formulate a more relevant and adaptive education strategy for Indonesia. The combination approach Singaporean practicality and British flexibility can become inspiration for creating a mathematics curriculum that is not only competitive globally, but also according to local needs. Understanding the advantages and disadvantages of each system, Indonesia can take lesson valuable from Singapore and United Kingdom to improve the quality of mathematics education.

METHOD

The method used in this study is. study library research, which focuses *on* analysis theoretical based on various references, especially literature relevant scientific (Sugiyono, 2013). Steps in method studies literature referring to the stages explained by Zed (2008), including: (1) preparation tool help research, (2) compilation bibliography work, (3) arrangement time in a way effective, and (4) the process of reading and making notes results study.

Data sources in study this originate from various related literature with topics studied, such as books, journals scientific, articles and works write anything else that is relevant. Data collection techniques were carried out with to collect information about variables study through document written, including books, journals, papers, and article scientific. Researcher using a checklist as instrument main for classify material study in accordance focus research, compile framework writing, and recording important data.

In analyzing data, research This apply method analysis content analysis, *which* allows researcher evaluate Contents from various source in a way in-depth and systematic. To ensure validity and accuracy results study, conducted verification cross between reference as well as reading repeat material libraries used. Report study this arranged with simplicity and accessibility for make it easier reader understand the essence of discussion presented. Choice This based on limitations ability researcher in do study more libraries detailed and in-depth. In addition, the simplicity maintained for the reader can with easy catch essence from studies comparative comparing education mathematics in Indonesia, Singapore, and United Kingdom.

RESULT AND DISCUSSION

Comparative study of the Indonesian, United Kingdom and Singapore based on the mathematics learning curriculum, evaluation system and teacher recruitment.

Mathematics learning curriculum

All three countries Indonesia, United Kingdom and Singapore, emphasize the importance of mastering basic mathematical competencies, such as number operations, geometry, algebra, and statistics. The curriculum in these three countries aims to develop critical thinking skills, problem-solving skills, and the application of mathematics in everyday life. In United Kingdom, the National Curriculum for Mathematics emphasizes learning that emphasizes problem solving, and the development of logical thinking skills in students from elementary to secondary levels (Hargreaves et al., 2023). Meanwhile, in Singapore, the mathematics curriculum focuses more on an in-depth approach to mathematical concepts with the aim of students understanding the basics of mathematics before moving on to more complex topics (Lindorff et al., 2019). In Indonesia, despite facing various challenges in implementing an effective curriculum, the Merdeka Curriculum which has been implemented since 2022 emphasizes learning that focuses on student competencies and character development, one of which includes problem-solving skills and mathematical applications (Farhana, 2023; Rangkuti, 2019).

The most striking differences between the three countries are in the structure and organization of the curriculum. In Singapore, the mathematics curriculum is highly structured and follows the Singapore Math model, which places a heavy emphasis on deep conceptual understanding before moving on to more complex skills (Ginsburg et al., 2018). This model is also known for using the Concrete-Pictorial-Abstract (CPA) approach, which

encourages students to understand concepts through more concrete representations, before moving on to abstract understanding (Pien, 2015). In the UK, the mathematics curriculum is more flexible and open. Teachers are given the freedom to choose teaching methods and strategies that suit their students' needs, although they are still tied to the standards set out in the National Program of Study (Oates, 2021). This curriculum also places an emphasis on the application of mathematics to everyday life and the development of critical thinking skills that students can practice. In Indonesia, with the newer Curriculum "Kurikulum Merdeka", there is an attempt to provide a more flexible and project-based approach to learning, including in mathematics. This curriculum focuses on student-centered learning and the development of 21st-century competencies, such as critical thinking, collaboration, and communication skills (Wahyudiono, 2023). However, challenges in implementing evenly across regions still exist, especially related to educational infrastructure and teacher readiness.

All three countries have begun to adopt a student-centered learning approach that emphasizes active student involvement in the learning process. This approach prioritizes problem solving, critical thinking, and independent exploration in mathematics learning. This is reflected in the implementation of a constructivist approach, where students construct their own knowledge through direct experience with mathematical concepts (Maharani et al., 2021). In addition, a problem-based learning approach is applied in all three countries to encourage students to solve problems that are relevant to real-world contexts. In Singapore, for example, mathematics learning uses a problem-based approach that combines concepts with practical applications to strengthen students' understanding of the material (Ginsburg et al., 2018). Similar things are also applied in the UK and Indonesia, although with different levels of implementation and consistency.

The main differences lie in the level of structure and teacher approach to classroom management. In Singapore, although there are student-based elements, the approach is still more structured and systematic, with more explicit instruction on the mathematical concepts that students should understand at each stage (Pien, 2015). This approach allows for more organized teaching, with clear steps in the development of mathematical skills. In the UK, the approach to mathematics learning is more flexible and relies more often on the use of technology to support learning. Students are often given open-ended challenges that allow them to work in groups or individually to solve problems (Golding, 2021). Teachers in the UK also have more freedom to design learning methods that focus on local needs and

contexts. In Indonesia, although there is a push to move towards a more active and project-based approach, many schools, especially in more remote areas, still rely on more traditional, teacher-centered teaching methods. Problem-based approaches are being introduced in the Merdeka Curriculum, but implementation varies depending on teacher training and access to educational resources (Hakim & Abidin, 2024).

The mathematics teaching methods in these three countries emphasize the development of critical thinking and problem-solving skills. In Singapore, the use of the Concrete-Pictorial-Abstract (CPA) method allows students to start with concrete experiences that can be seen and held, then move on to mathematical images and symbols before finally understanding the concept abstractly (KY Wong, 2015). This approach aims to strengthen students' conceptual understanding in a more structured way. In the UK, the use of educational technology in mathematics teaching is growing (Guntur et al., 2020). Digital tools such as learning applications and mathematics software help students practice mathematics problems interactively and get real-time feedback (Guntur & Setyaningrum, 2021). This is in line with the global trend in mathematics education that uses digital media to enrich the learning experience (Maiyarni et al., 2022).

In Indonesia, although technological challenges still exist in some areas, the Independent Curriculum encourages the use of digital media in learning, including for mathematics subjects, to improve students' skills in accessing information and collaborating in solving problems (Guntur et al., 2019). The main difference lies in the level of technology use and access to educational resources. In Singapore and the UK, the use of educational technology is already very widespread, with the use of interactive mathematics software and digital learning platforms. In Singapore, for example, students use technology as part of a more integrated learning, while in the UK, technology is often used to complement face-to-face learning (Pien, 2015). In Indonesia, although there have been efforts to introduce technology in teaching through the Independent Curriculum, its implementation is still limited, especially in less developed areas (Guntur & Setyaningrum, 2021). Limited access to digital devices and teachers' skills in using technology are challenges in implementing technology-based teaching methods (Guntur et al., 2019).

Table 1. Differences in mathematics curriculum in Singapore, Indonesia and England.

Aspect	Indonesia	Singapore	English
Curriculum	The Independent Curriculum provides flexibility but	Spiral curriculum (Singapore Math), emphasizes in-depth	The English National Curriculum gives schools the flexibility

	emphasizes basic theory and is often less integrated with practical applications.	concepts and full mastery before moving on to new topics.	to adapt learning to suit students' needs.
Learning methods	Lectures still dominate, although some schools are beginning to adopt a project-based or problem-based approach.	The "Singapore Math" method uses a concrete-pictorial-abstract (CPA) approach to build deep understanding.	Project-based approach, collaboration and practical application through discussion and group work.
Study Duration	Approximately **5-6 hours/week** for mathematics at the elementary level.	Approximately **7-8 hours/week**, with additional time for remedial and enrichment.	Approximately **4-6 hours/week**, depending on school policy.
Pedagogical Approach	Focus on problem solving and memorizing formulas, although there is a shift towards problem solving and analysis.	A problem-solving based approach with a high focus on visualization and application of concepts.	Focus on developing critical thinking and the use of technology to support learning.
International Achievements	**PISA 2022 Scores**: Indonesia has a low score in mathematics compared to other OECD countries.	**PISA Scores 2022**: Singapore consistently tops mathematics globally.	**PISA 2022 scores**: UK is above OECD average in maths.

Evaluation System

Indonesia implements competency -based evaluation standards in accordance with the Independent Curriculum, which introduces project based approach for measure students' understanding at the level conceptual and application (Firdaus et al., 2022). The evaluation was carried out using three main methods namely diagnostic evaluation , formative evaluation , and summative evaluation (Jafar & Wasila1, 2024). First evaluation diagnostics are carried out at the initial stage of learning or when accepting new students. Both assessments formative assessment is carried out during the learning process to provide feedback for students and teachers. This assessment includes observation, group discussions, and practice questions. Project-based evaluation is also starting to be implemented for evaluate students' ability to solve problems in context real. However, this implementation still faces obstacles, such as inequality. facilities and teacher training in various regions (Muntatsiroh et al., 2023). Third, a session summative, conducted at the end of the learning cycle, such as midterm and final semester exams. In the previous curriculum there were national exams but in the independent curriculum changed to National Assessment which includes ability literacy student numeracy (Marlena et al., 2022).

England uses a standardized evaluation approach in a way nationally through formal examinations such as GCSE (General Certificate of Secondary Education), which is an important part of system mathematics education at the level medium. Focus Evaluation Assessment designed for test understanding in-depth understanding of mathematical concepts, problem solving skills, and abilities communication mathematical. Exams in the UK emphasize mastery draft abstract and application to situations life real. This allows students to connect mathematical theory with practical applications (Childs & Baird, 2020).

Singapore is known with an evaluation approach that places great emphasis on understanding in-depth through the CPA (Concrete-Pictorial-Abstract) model. Progressive-Based Evaluation: Assessment started with manipulation concrete, followed by a visual representation, and ending with with symbol abstract. This method is used to build understanding in-depth and gradual (KY Wong, 2015). Examinations such as the Primary School Leaving Examination (PSLE) are national evaluation standards that test ability students' analytical skills through complex contextual problems (H. M. Wong et al., 2020). The mathematics assessment standards in Singapore are designed For ensure students not only understand draft but also capable applying it in various scenarios (Lee & Ho, 2022).

The three countries have similarities in evaluating ability conceptual and problem-solving skills of students. Assessment formative and summative applied to provide an overview of student progress, while national exams serves as a benchmark measure learning outcomes at the level certain.

Table 2. Standard table evaluation evaluation Mathematics in Indonesia, United Kingdom, and Singapore

Aspect	Indonesia	English	Singapore	Equality
Approach Evaluation	Assessment based on competencies, including formative and summative	Based on standard national (GCSE), focus on analysis conceptual	CPA (*Concrete-Pictorial-Abstract*), focus progressive and solution problem	Evaluate understanding conceptual and skills breakdown problem.
National exam	Assessment, including literacy numeracy	GCSE measures understanding depth and application practical	PSLE assesses analysis and application based on context real	The three of them own exam national for measure results study at level certain.
Focus Evaluation	Competence basic, literacy numeracy, and	Conceptual, abstraction, and real -world applications	Understanding progressive from concrete to abstract (CPA)	Focus on development understanding conceptual and

	application project			ability analytical student.
Context Evaluation	Customized with level regional development and policy	Focus on uniform standards across all areas of education	Highly standardized with attention to visual engagement	All countries integrate various form evaluation for fulfil objective learning national.

Teacher Recruitment

Recruitment in Indonesia shows significant difference between public schools and schools private, good from aspect procedure and the status offered to power teacher. In the context of public schools, the teacher recruitment process is carried out by the government with consider need formations in various regions. Teachers recruited in category This has the status as Civil Servants (PNS) or Employee Government with Agreement Work (PPPK). On the other hand, at school private, recruitment process carried out by the foundation that oversees school said, with implementation usually delegated to head school. Teachers working below shade school private generally status as an honorary teacher (Marlinda et al., 2023).

Recruitment of civil servant teachers is regulated in a way national and involving stages strict selection, including selection administration, selection competence basic, and selection competence field. This process designed for ensure that the teachers recruited own appropriate competency with standard education national. In case age, there is limitation maximum 35 years for prospective civil servants. In addition, civil servant teachers have the status as employee remain equipped with Number Parent Employee (NIP). Based on Constitution Number 5 of 2014, civil servant teachers have the right get a number of rights, including wages fixed, allowance, facility work, rights leave, guarantee retirement, and opportunities for development competence professional they.

Improvement career for civil servant teachers it is also regulated in a way hierarchical based on levels position. Stages This started from Junior Teacher (group IIIa-IIIb), Middle Teacher (IIIc - IIId), Middle Teacher (IVa-IVb), to Main Teacher (IVc-IVd). System This give incentive based on performance and experience work, which allows teachers to increase his competence along time. For PPPK teachers, their status is employee contract with a minimum of one working period year, which can extended until maximum 30 years.

Although PPPK teachers do not own access to facility certain like guarantee day old or pension granted to civil servants, advantages they are no existence limitation age for follow selection. Selection process covering stage administration, competence, and interviews, with objective for identify capable teachers fulfil need education in a way flexible.

In the sector private, foundation that manages school own authority for recruiting honorary teachers. This process usually more flexible compared to with recruitment in public schools, although often not involving standard uniform selection. Honorary teachers at school private generally accept more compensation low compared to PNS or PPPK teachers, and rights they, like guarantee social and benefits , often depending on the policies of each foundation (Soebiartika & Rindaningsih, 2023).

Honorary teachers, both in state and private schools private sector, facing a number of challenges, especially related with salary and facilities work. Honorary teacher salary often not comparable with not quite enough answer they shoulder strap, and things This exacerbated by dependence on operational funds school, such as Help Operational School (Bantuan Oprational Sekolah). In some case, politics practical also affects appointment of honorary teachers, especially after election head area, which gives rise to inconsistency in standard recruitment. For support sustainability appointment of honorary teachers, government area often give incentive fiscal, which aims to for increase teacher welfare. However, step This Still need supported by more policies comprehensive for welfare and recognition professionalism of honorary teachers can increase in a way significant. Teacher recruitment in Indonesia shows difference fundamental between public and private sectors. PNS and PPPK teachers in public schools have clarity of status and access to supporting facilities development professional they, while honorary teachers in the sector private often face uncertainty in matter compensation and facilities work. For increase quality education national , required policies that ensure teacher recruitment is carried out in a way evenly distributed, fair, and based on relevant competencies, without ignore aspect welfare and professionalism power teacher (Soebiartika & Rindaningsih, 2023).

In United Kingdom, there are three main routes that can followed for fulfil requirements as a teacher. First, prospective teachers can follow course for three years for obtain an educational certificate non-graduate. Second, individuals can study for three to four years year use to obtain Bachelor of Education degree. Third, for those who have own title Bachelor's degree in non- education field, one-year program available years of postgraduate study such as the *Postgraduate Certificate in Education* (PGCE). In addition,

basic competency standards in mathematics and English, equivalent with GCE 'O'-Level, is also expected to be basic qualifications possessed by prospective teachers (Behle, 2017).

Teachers in United Kingdom also have chance for take specialization in a field or level education certain. However, they are only allowed to teach at a level appropriate to the qualifications they have obtained. For example, in further education (*further education*) and postgraduate education. high, no required certain formal qualifications to teach, but development professional and experience remain important factors.

To become a registered teacher in the UK, prospective teachers must obtain Qualified Teacher Status (QTS), which is issued by the National College for Teaching and Leadership (NCTL). This certification is obtained through an Initial Teacher Training (ITT) programme, which is run by universities, school training consortia or training institutions. education tall others. The ITT program is designed to provide intensive training that includes educational theory and direct practice in the classroom. After completing this program, participants are required for following an induction period of one academic year , which becomes part from the evaluation of their suitability to teach (Parry et al., 2017).

In level further education, teachers are also required own additional qualifications such as *Qualified Teaching and Learning Skills* (QTLS) or *Associate Teaching Learning* (ATL). These qualifications focus more on the technical and professional skills required to teach at the higher level of education. As in many countries, the UK faces challenges significantly related to teacher shortages. The increase in the number of students and the level of resignation teacher self before reaching age pension has create emptiness in energy formation educators. To overcome this problem, the government and educational institutions education has strengthen recruitment of prospective teachers through various channels, such as the *Teach First* program, *School-Centered Initial Teacher Training* (SCITT), and research -based programs such as *Research in Schools* (Parry et al., 2017). After obtaining QTS and passing the test skills, teachers are required for undergo a trial or induction period for one years academic year, which is divided become three period school assessment. Induction period can be done full time or part time. If done part time part time, duration can be extended up to two academic years. Assessment during the induction period is carried out by the induction tutor or the principal, who evaluates teacher performance based on established competency standards. Final recommendations from induction tutors Then reported to the relevant agency, which determines whether the prospective teacher has fulfil criteria for become official teachers. Unlike Indonesia, teachers in United Kingdom

are not classified as civil servants. They are recruited based on local needs by the government the area or institution that manages the school. This provides more flexibility in the recruitment process, while still adhering to the qualification standards set by the NCTL (Whiting et al., 2018).

Stages for Becoming a teacher in Singapore is a very structured and designed process. For ensure that only individuals with the best qualifications to be educator (Darling-Hammond, 2017). This system is recognized as one of the best models in the world, with integration between educational theory, field practice, and development sustainable professionalism. The initial selection process begins with admission to the National Institute of Education (NIE), the only teacher training institute in Singapore. NIE works closely with the Ministry of Education to choose candidates who have academic record and extraordinary potential. Only about 30 % of applicants accepted each year, ensuring that prospective teachers have solid academic background and abilities. This selection includes evaluation academic ability, interview for evaluate commitment and motivation candidates, as well as health check. After being accepted at NIE, prospective teachers undergo a structured training program according to their level. education they will teach. The program includes intensive training in learning theory, classroom management, and methodology. teaching In addition, prospective teachers are also equipped with educational technology skills for supports modern learning, including online learning which has become an integral part of the post-pandemic curriculum (Darling-Hammond, 2017; Lim & Khine, 2016). One of the A key components of teacher training in Singapore is practical experience field. Partnership between NIE and local schools enables prospective teachers to Gain hands-on teaching experience under the guidance of an experienced mentor. This practice helps them understand context education in the field, applying theory to practice, and developing ability managerial in real classroom environments (Liu et al., 2014).

After completing the educational program pre-service, prospective teachers must obtain an official teaching certificate from the NIE to can working as a teacher. Induction period One year also becomes an important part of this transition. During the induction period, new teachers receive additional guidance and regular assessments to ensure their abilities meet professional standards. After becoming a teacher, the Singapore government continues support development professionals through additional training and improvement programs competence (Tan, 2018). Teachers are encouraged for become learner lifelong and contribute to research education, so they can Keep going relevant with changes in the

world of global education. Stages being a teacher in Singapore reflects the country's commitment to education quality tall (Low, 2018). Rigorous selection process, practice-based training, and focus on development sustainable ensure that teachers in Singapore have required competencies for support student achievement at the level nationally and internationally, as reflected in the PISA test results. With this approach, Singapore has succeeded in making the teaching profession as a prestigious and influential career in development nation (Teo, 2018).

Table 3. Comparison table of teacher recruitment processes in Indonesia, UK and Singapore:

Aspect	Indonesia	English	Singapore
Minimum Qualifications	Bachelor (S1) in the field education or field related. Teacher certification through the Teacher Professional Program (PPG).	Bachelor's degree (S1) in the field of whatever. Completion training pedagogy, such as *Postgraduate Certificate in Education (PGCE)* or School Direct.	Bachelor's degree (S1) with performance academic high. Accepted at the National Institute of Education (NIE) for teacher training.
Initial Training	Professional Education Program (PPG) which includes theory, practice teaching, and exams teacher competence.	Programmes such as PGCE include theory education, practice in schools, and observation by mentors.	Training intensive in NIE, including theory education, pedagogy, and practice field at school.
Selection Process	Test administration and academics. Interview and competency test. Placement based on need school.	Interview and selection process based on experience as well as qualification academic. Focus on competence practical prospective teacher.	Selection strict based on academic and interview for evaluate commitment become a teacher. Assessment potential leadership and pedagogy.
Certification	Certification done after passing PPG and taking the Teacher Competency Test (UKG).	Teachers obtain Qualified Teacher Status (QTS) after finish training or accredited program.	Certification automatic after finish training at NIE and mandatory follow evaluation performance after work at school.
Development Professional	Must follow training and workshops from government. Development Program Profession Sustainable (PKB).	Development program professional mandatory, including training *Continuing Professional Development (CPD)*.	Training regular by the Ministry of Education (MOE). Support development career based on performance and evaluation performance.

DISCUSSION

Mathematics education is an important component in building skills think logical and problem-solving skills needed in the era of globalization. However, survey results such as PISA (Programme for International Student Assessment) show that Indonesian students' achievements in mathematics are still left behind compared to with countries such as Singapore and the UK. This study aims for identify aspects that can implemented in Indonesia based on mathematics learning in Singapore and United Kingdom, with focus on curriculum, evaluation systems, and teacher recruitment.

Singapore has a very focused curriculum, with Concrete-Pictorial-Abstract (CPA) approach that helps students understand mathematical concepts in This approach allows students not only to memorize, but also to understand and apply concept. United Kingdom, on the other hand, emphasizes inclusive and contextual learning, with a curriculum designed for develop ability analytical and creativity. The opportunity for implementation in Indonesia is by adopt The CPA approach to the Independent Curriculum to help students understand draft in a way in depth, especially at the basic level.

As in United Kingdom, Indonesia can develop a more relevant curriculum with students ' daily lives, so that increase the attractiveness of learning mathematics. In addition, Indonesia can reduce regional disparities by providing guidance clear curriculum implementation, as in Singapore. The evaluation system in Singapore combines formative evaluation with test diagnostic for monitor student development comprehensive. In the UK, evaluation emphasizes balance between test summative tasks such as GCSEs and formative tasks. such as projects involving skills think critical. Opportunities for Implementation in Indonesia, the government can develop formative evaluation tools, such as project assignments and tests diagnostics, for support more sustainable learning. National Examination reform as a replacement for memorization -based evaluation, exam questions can designed for measure skills think critical and analytical students. Provide training to teachers to use formative evaluation and understand students' needs based on evaluation results.

In Singapore, the selection of prospective teachers is very strict, with training centralized at the National Institute of Education (NIE) for ensure the quality of teaching. The UK has programmes such as Teach First and Initial Teacher Training (ITT), which provide flexible pathways for aspiring teachers with mathematical background to enter the world of education. The opportunity for implementation in Indonesia is to tighten selection

of prospective teachers, with focus on expertise in mathematics and abilities pedagogy, as is done in Singapore. Increasing training through institutions centralized national to provide consistent teaching standards. Implement programs such as Teach First to attract the best graduates from various fields into the world of mathematics education, especially for remote areas.

CONCLUSION

Mathematics education in Indonesia has significant potential to be improved through learning from best practices that have been implemented in countries such as Singapore and the UK. Both countries have demonstrated success in designing and implementing mathematics learning strategies that not only improve students' conceptual understanding, but also critical thinking and problem solving skills. By adopting approaches that have been proven effective in both countries, Indonesia can create a mathematics education system that is more innovative, relevant and in line with the demands of the times. However, this implementation requires special attention to the local context, including cultural diversity, educational infrastructure, and the readiness of teaching staff. Strong government support is essential, not only in the form of supportive policies, but also in the allocation of adequate resources. In addition, collaboration with various parties, such as academics, educational practitioners and the community, is needed to ensure that the adaptation of this strategy runs holistically and sustainably. Through planned strategic steps, Indonesia can make mathematics education an important pillar in improving the quality of human resources to compete at the global level.

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