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A Comparative Analysis of the Intended Mathematics Curriculum of Cambodia and Singapore: Focus on Geometry

Sieng Veasna [1*]

[1]Graduate School for Humanities and Social Sciences, Hiroshima University, 1-5-1, Kagamiyama, Higashi-Hiroshima city, 739-8529, Japan

**Email Correspondence:* sieng.veasna@nie.edu.kh

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ABSTRACT

Cambodian students' achievement is low in geometry problem-solving ability. This study aims to compare the intended mathematics curriculum of Cambodia and Singapore, with a specific focus on geometry. Four recently revised Cambodian mathematics syllabi, published in 2018 and two Singaporean mathematics syllabi, published in 2020, have been collected and analyzed following the General Topic Trace Mapping procedure. This analysis reveals significant differences between Cambodian and Singaporean mathematics curricula in design, structure and coherence, followed by domain, sub-domain, contents, sub-contents and learning outcomes within and across the grade. It also highlighted that the Cambodian mathematics curriculum on geometry lacks coherence in content, sub-content, and learning outcomes, potentially lowering student achievement. Enhancing curriculum coherence could significantly improve student learning outcomes in Cambodia.

1. Introduction

The curriculum forms the basis for an effective education system that ensures quality learning for all learners and prepares operational goals and local citizens (UNESCO, 2016). It was determined as a package of knowledge, skills, and attitude. The curriculum was comprised of three forms: the intended curriculum, the implemented curriculum and the attended curriculum (Kyi & Isozaki, 2023; Schmidt et al., 2001). The intended curriculum consisted of the syllabus and involved textbooks because many teachers trust them as essential resources in classroom teaching, usually in groups with supplementary material such as teachers' guides, lesson planning, workbooks and worksheets (McDonald &

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Abd-El-Khalick, 2017; Valverde, 2002).

Since the curriculum is crucial, many countries are reviewing their national curriculum and asking: "Is the curriculum relevant and responsive to the needs of today's market ?" (MoEYS, 2016). Thus, to meet the world market's needs, many developing countries have revised their curriculum and tried to adapt to the developed countries to strengthen the quality of their education system.

However, Cambodia has no objection to looking back and investigating its curriculum to meet the global context by revising the curriculum, respectively. Cambodia became independent from French colonial rule in 1953, and the current general education practice only started after the end of the civil war of 1975-1979 (Khmer Rouge). The Cambodian general education system was divided into three levels: primary (Grade 1 to Grade 6), lower (Grade 7 to Grade 9), and upper secondary (Grade 10 to Grade 12).

The Ministry of Education, Youth, and Sports (MoEYS) of Cambodia has revised the curriculum for general and technical education (CGTE) five times. First, from 1980 to 1987, it was shaped by the immediate needs of a nation emerging from conflict, mainly focusing on political education, basic literacy, and practical skills for national reconstruction (Dy, 2004).

Second, from 1987-1996, it was characterised by a balance between the need to rebuild and modernise the education system while maintaining a strong emphasis on national identity, culture, preservation, and practical skills development. Third, from 1996 to 2005, the curriculum marked a transition from an education system focused on recovery and ideological indoctrination to one that increasingly embraced modernisation, globalisation, and the holistic development of students (Chealy et al., 2014; Chhinh & Dy, 2009).

Fourth, from 2005 to 2015, MoEYS developed a curriculum policy to develop a CGTE, a core curriculum for basic education (from grades 1 to grade 9), and a basic curriculum for upper secondary education (from grades 10 to grade 12). This period was marked by a transitional phase where Cambodia aimed to align its education system with international standards while addressing local needs and challenges.

Last, from 2015 until today, the Cambodian curriculum emphasises competency-based education, focusing on science, technology, engineering and mathematics (STEM), information communication and technology (ICT) integration, and global citizenship. It promotes inclusivity, environmental sustainability, and life skills while strengthening vocational training and modern assessment methods (MoEYS, 2016, 2019).

Even though the Cambodian curriculum for general education has been revised many times in general education, students' learning achievement remains low (Bhatta et al., 2022; MoEYS, 2023). Various scholars addressed that designing a curriculum as coherent can help to improve student learning achievement (Cuoco & McCallum, 2018b; Schmidt et al., 2005; Wang & Kao, 2022) and necessitate innovative approaches to teaching and learning. On the other hand, an inappropriate curriculum can significantly hinder student learning and achievement, leading to long-term consequences for both individuals and the education system as a whole (Reeves & McAuliffe, 2012; Schmidt et al., 2005).

However, according to the National Learning Assessment (NLA) of November 2021, students' achievement in mathematics remained low compared to the NLA of 2016, where the overall score was only 38%. The lowest average

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achievement was in the Geometry domain, among the others (Algebra, statistics, Measurement, and Numbers), with only 35% of sixth graders and 46% of eighth-grade students completing the assessment test correctly. Similarly, the 12th grader national examination report in the academic year 2020–2021 showed that only 47.93% of students could solve Geometry problems correctly, particularly vector contents, which Geometry covered (Bhatta et al., 2022; MoEYS, 2022, 2023). All these indicators reveal insufficient student achievement.

Factors which influence students' low achievement have been identified as educational policy, curriculum, and school-related, personal, and social factors (Wang & Kao, 2022; Wang & McDougall, 2018). Among these, the curriculum is one of the most influential factors because it is the starting point for teaching and learning activities. Thus, the curriculum should be met and aligned with broader educational goals, objectives, contents, sub-contents, and learning outcomes. In other words, curriculum coherence is the most dominant predictive for student achievement because it refers to the connection and logical progression of contents, skills and learning outcomes within a curriculum framework, syllabus, textbook, and assessment (Cuoco & McCallum, 2018b; Schmidt et al., 2002). For instance, the Singapore mathematics curriculum is designed to provide a clear and coherent framework that aligns with students' developmental needs. It emphasises critical mathematics processes such as reasoning, communication, and modelling, which are essential for teaching students to understand and apply mathematics in a real-world context. Its structured approach, focus on competencies, adaptability to diverse learning needs, integration of technology, real-world relevance, and emphasis on assessment collectively enhance the learning process and improve student achievement (MOE, 2020, 2021).

There are two main types of curriculum coherences: internal coherence and external coherence, which scholars defined. Through a curriculum with internal coherence, students are more likely to experience a logically connected progression of learning experiences, which can contribute to a deeper understanding and mastery of the content (Wang & McDougall, 2018), while the external coherences which can be aligned with social needs and expectation because social needs and expectation does not belong to the education itself. So, both internal and external coherences form the overall coherence of the curriculum. This paper will focus only on internal curriculum coherence because it is assumed to be more directly concerned with student learning achievement. The types of curriculum coherence and their description is shown in Table 1.

Table 1. Type of Curriculum Coherence

Type	Aspects	Descriptions
Internal coherence	Structural	grades or grade bands, content domains, cognitive domains
	Content relation	different contents within a certain topic
	Pedagogical	objectives, instructional processes, learning outcomes, and assessment
External coherence		Relation with social needs and expectation

Sources: (Veasna & Baba, 2024)

Table 1 shows that internal coherence consists of three interrelated aspects:

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structural, content relation, and pedagogical. These relations mean that an effective curriculum design considers the interplay between these three aspects to create a consistent and profound learning experience for students. Among the three, the content relation aspect will be the focus of this paper because it can most effectively direct student learning achievement by ensuring that the curriculum is organised coherently and meaningfully (Confrey et al., 2017; Watson & Ohtani, 2015). By establishing meaningful connections between concepts, educators can help students see the relevance and significance of what they are learning, leading to deeper understanding and retention of the material.

For this purpose, there is a need to confirm the curriculum coherence of Cambodia's curriculum. Along these, according to Trends in International Mathematics and Science Study (TIMSS), the Singapore mathematics curriculum is highly appreciated for several reasons by different scholars and has resulted in Singapore students consistently ranking at the top in international mathematics assessments such as TIMSS and Programme for International Student Assessment (PISA) (Kadijevich et al., 2023; MoEYS, 2024). And the Singaporean curriculum is often noted for its coherence (Grey, 2020; Hairon, 2021). Therefore, in this study, the Singaporean curriculum was selected for comparison with the Cambodian curriculum to examine the differences between them, particularly in terms of curriculum coherence, with a focus on content relationships and structure.

In order to analyse the curriculum from the perspective of coherence, in this paper, curriculum coherence is defined as the relation between corresponding design, structure, and coherence, followed by domains, sub-domains, contents, sub-contents, and learning outcomes within and across grades, and they are all arranged in order as a whole. Therefore, this study intends to do a comparative analysis of the curriculum coherences of Cambodia and Singapore, particularly focusing on Geometry. Two main questions have been raised:

1. What are the key differences and similarities between the Cambodian and Singaporean mathematics curricula in terms of curriculum coherence?
2. To what extent do the geometry curricula in Cambodia and Singapore exhibit coherence in terms of their relation to design, structure, and coherence?

2. Method

2.1. Data Source

This study used four recently revised Cambodian mathematics syllabi (MoEYS, 2018a, 2018b, 2018c, 2018d) and two Singaporean mathematics syllabi (MOE, 2020, 2021) for analysis. These were the latest versions available during the research period of study, and together, they cover primary and secondary education. The Cambodian mathematics curriculum (CMC) was divided into primary education (Grades 1 to Grades 6), lower secondary education (Grades 7 to Grades 9), and upper secondary education (Grades 10 to Grades 12) in general education. The last syllabi for grades 10 to grades 12 are separated into two files: the science track and the social science track. The Singaporean syllabus for primary one to six, which is the implementation starting with the year 2021, primary one cohort, and the mathematics syllabus for secondary one to four

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express course for normal (academic) course published in 2023 was used for this analysis. All syllabi contain goals, objectives, domains, contents, sub-contents, and learning outcomes.

2.2. *Data Analysis Method*

For the Cambodian mathematics syllabus, all the syllabi were translated from Khmer into English. Contents and sub-contents were translated exactly the same as the original, and the contents and sub-contents within geometry were allocated according to domains and sub-domains. The geometry domains were divided into five sub-domains: plane geometry, solid geometry, relations and transformations, constructions, and vectors. The contents and sub-contents were identified by analysing the syllabi for grades 1–12. Similarly, the learning outcomes were translated and summarised under knowledge, skills, and attitudes. The translation aims to facilitate consultations with mathematics experts regarding consistency and ensure the syllabus analysis's validity and reliability. The original English version of the Singaporean mathematics syllabi was used.

The data were then inputted into an Excel sheet. The domains, sub-domains, contents, sub-contents, and learning outcomes were arranged from grades 1 to 12 and examined within the same grade and across grades to determine whether the domains, subdomains, contents, sub-contents, and learning outcomes were related and corresponded to each other. Similarly, the Singaporean curriculum was examined in the same way.

In this study, the domains, sub-domains, contents, sub-contents and learning outcomes were analysed using General Topics Trace Mapping (GTTM), which was developed for content analysis in the Trends in International Mathematics and Science Study (TIMSS) (Schmidt et al., 2005). It provides a way to compare and analyse curricula across countries, identify the content intended for teaching at each grade level, and examine the relationship between content, sub-contents, and learning outcomes. Based on this GTTM, the following procedures are set:

We first collected both countries' syllabi to identify the overview of the constructed curriculum structure. In this step, the big idea, content, and expected learning outcomes were investigated.

Second, we collected all the geometry contents from both countries' syllabi and arranged each of them into appropriate sub-domains per grade. In this step, the sub-domains and contents are extracted from the syllabi and the grade levels when the contents with the sub-domains are to be addressed to confirm whether they are repeated or sequenced for all sub-contents.

Third, it compares the contents, sub-contents, and learning outcomes across domains, subdomains, and grades. In this step, we compare the sequencing of those contents, sub-contents, and learning outcomes that are clearly related. Then, show the result of the curriculum response to the perspective of curriculum coherence, which has been indicated as the relation between corresponding domains, subdomains, contents, sub-contents, and learning outcomes within and across grades, and they are all arranged in order as a whole.

Finally, it shows the difference between the Cambodian and Singaporean mathematics curricula. This step identified the conclusion of the result of the curriculum comparison and provided better improvement for developing

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curriculum coherence.

3. Results and Discussion

3.1. Result

Based on the comparative analysis through the mathematics curriculum of both countries by the following steps described above, we have obtained the following results:

3.1.1. The comparison of the overview of the constructed curriculum structure

There are different perspectives on developing the curriculum framework for both countries, such as the Cambodian mathematic curriculum (CMC) framework aimed to improve the quality of education by upgrading students, followed by the knowledge, skills, and attitudes necessary to thrive in daily life and further studies. The framework seeks to ensure students develop their full potential, enabling them to contribute to national development and integrate into the global community. It includes fostering competencies in areas such as literacy, numeracy, critical thinking, and the ability to apply knowledge in practical contexts, all in alignment with Cambodia's goal of becoming a middle-income country by the year 2030 and a high-income country by the year 2050. Unlike the standards and the Singaporean Mathematics Curriculum Framework (SMCF), both aim to improve mathematics education in different socio-cultural contexts, emphasising content and learning processes in various subjects with a focus on student learning experiences.

Additionally, the Cambodian curriculum exhibits challenges of incoherence due to misalignment across educational levels, limited integration of subjects, and lack of coherent skill progression. In contrast, the core competencies outlined in the Singapore mathematics curriculum are designed to equip students with essential skills for the 21st century, including mathematical concepts, skills, processes, metacognition, and attitudes. These interrelated competencies support students in applying mathematics knowledge and skills for future changes in various fields. There are different perspectives on developing curriculum frameworks between Cambodian and Singaporean curricula. The summary of the differences in the curriculum framework of both countries is shown in Table 2.

Table 2. The Summary of Overview of the Constructed Curriculum Structure

No.	Cambodia	Singapore
1.	Focus on developing student's awareness of how mathematics is used in their own and other communities.	Emphasises a conceptual and ideological approach.
2.	Stress analysing a mathematical concept, such as logical reasoning.	In-depth conceptual understanding, skills, proficiency, and mathematical procedure and emphasis on attitudes and metacognition.
3.	Emphasis on applying the learning outcomes with a focus on knowledge, skills, and attitude.	Build a strong foundation in mathematical concepts based on student learning experiences, mainly focusing on problem-solving skills.

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Table 2 highlighted that both Cambodia and Singapore value a comprehensive approach to mathematics education. Although their methods and emphases differ, with Cambodia focusing more on practical application and awareness and Singapore on deep conceptual understanding and problem-solving.

3.1.2. The comparison of sub-domains and contents

The arrangement of sub-domains and contents extracted from syllabi and grade level are to be addressed and indicated with the symbol ■. In this case, the sub-domain is plane geometry. An example of a comparison of sub-domains and contents is shown in Table 3.

Table 3. Example of a Comparison of Sub-Domain and Contents

Cambodia													Singapore												
Plane Geometry	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Plane Geometry**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Point, line, and curve	■												2D Shapes	■	■										
Pattern	■												Perpendicular and parallel-lines			■									
Two-dimensional geometry shape		■					■						Area and perimeter			■	■	■							
Rectangle and the triangle			■										Angles			■	■	■							
Area and perimeter			■	■		■							Rectangle and square				■								
Angle				■	■		■						Area of triangle					■							
Square and rectangle				■									Triangle					■							
Construction geometry					■								Parallelogram, rhobus, and trapesium					■							
Area of a triangle					■								Area and circumference of circle						■						
Foundation of geometric shape							■						Angles, triangles, and polygons							■	■				
Perimeter and the area of polygon							■						Pythagoras' theorem and trigonometry								■				
Rectangle								■					Mensuration								■				
Polygon								■																	
Area of rectangular								■																	
Circle						■																			
Perimeter and area of circles							■																		
Circle and position between a circle and a line								■																	
Lines and a special segment meet inner the triangle								■																	
Circles and lines									■																
Properties of the angle of the circle and regular polygons									■																
The thales theorem									■																

Note: Bold font indicates a sub-domain; others are contents; ■ the content within the sub-domain content is to be addressed.

Table 3 illustrates the comparative analysis of the Cambodian and Singaporean mathematics curricula on plane geometry domains. Cambodian curriculum, comprehensive analysis shows that the relation of some sub-

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domains and contents are not continuously dealt with or are repeated by simply adding superficial complexities to the contents without much difference in geometrical ideas from lower to upper grade. An example of non-continuous treatment is the 'Two-dimensional geometry shape' content. It was addressed in grade 2 and again in grade 7, meaning it is not continuously treated from grade to grade. Similarly, 'Area and parameter' and 'Angle' are also not continuously treated from grade to grade.

However, the Singaporean curriculum was designed and addressed coherently and continuously from grade to grade. For example, the contents of 'Area and parameter ' and 'Angle' are repeated with the same contents. In contrast, the whole curriculum has less content than the Cambodian curriculum and each content is followed by student learning experiences. The curriculum shows a structured progression of geometric concepts, beginning with basic shapes in early grades and gradually introducing more complex topics as students advance. There is a clear emphasis on foundational concepts like 2D shapes, area, and perimeter in the early grades, which serves as the basis for more complex topics like trigonometry and mensuration in later grades. The curriculum appears to be designed to build upon students' knowledge incrementally, ensuring that by the time they reach higher grades, they have a solid understanding of the basics, enabling them to tackle more challenging topics.

3.1.3. The comparison of contents, sub-contents, and learning outcomes between both mathematics curriculum

The results of the analysis of both curricula highlighted that different structures are addressed in each country's curriculum. The example of the differences between them is shown in Table 4.

Table 4. The Example of the Mathematics Curriculum of Both Countries for Grade 1

Cambodia			Singapore		
Contents	**Sub-contents**	**Learning Outcome**	**Contents**	**Sub-contents**	**Learning experiences: The students should have opportunities to:**
			2D Shapes	1.1) identifying, naming, describing and clasifying 2D shapes • rectangle • square • circle • triangle 1.2) making/completing patterns with 2D shapes according to one or two of the following attributes • size • shape • colour • orientation	a) recognise, name and describe the 4 basic 2D shapes (rectangle, square, circle and triangle) from real objects and pictures (drawings and photographs). b) trace the outline of 2D shapes from 3D objects. c) identify and describe 2D shapes in different sizes and orientations. d) form a 2D shape from cut-out pieces of the shape. e) guess a 2D shape from a description of the shape f) recognise and describe the differences/similarities betwewen two 2D shapes according to attributes such as sides, corners, sizes and colours. g) work in groups to sort 2D shapes in different ways and explain how the shapes are sorted. h) use 2D shapes or applets to create patterens according to one or two attributes (size, shapre, colour and orientation) and describe the pattterns, i) work in groups to create a pattern and invite other
Point, Line, and curve	- Point and line - Curve and neckless (not straight line)	- set a point, draw a line, curve and neckless, connection the point to create a line and another shape.			
Geometry shape	- set a point, draw a line, curve and neckless, connection the point to create a line and another shape.	- draw a two-dimensional geometry shape that has 4 sides by using a line and draw a circle by using a thing as a circle - compare and describe the size of things that they used to know as two-dimensional (eg. a Whiteboard is a rectangle) - compare and describe the size of things that they used to know as two-dimensional (eg. a box of chalk, Cubes...) - Draw shape and geometry at a point or sample that has given - fill the pattern by size, and color, and create samples by size, and color...			
Patterns	- Patterns by shape - Patterns by size - Patterns by color	- fill the pattern by shape, size, and color - create a sample by shape, size, color			

Table 4 indicates that there is more geometry content in the first grade of the Cambodian mathematics curriculum. Students need in-depth thinking skills to understand this content. The sub-contents depend heavily on each main content. However, the sub-contents and learning outcomes do not correspond to each

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other, as it is unclear which learning outcomes align with specific sub-contents and contents. For example, the content of 'Point, line, and curve' consists of three knowledge and skill areas, but the sub-content is addressed in only one paragraph, combining all three. This can confuse teachers when preparing teaching materials, and textbook writers may face difficulty distinguishing between them.

In contrast, at the same grade level, the Singaporean mathematics curriculum (SMC) consists of less content. For instance, the sub-contents listed cover the knowledge of 2D shapes. The learning outcomes are structured as steps in the learning trajectory, progressing from one step to the next. This approach can help teachers develop teaching materials more easily and guides textbook writers in following each step. Therefore, the analysis can determine that the CMC is still not fully coherent compared to SMC.

However, to better meet students' needs through this comparative analysis, the curriculum should enhance its existing spiral approach by strengthening the connections between different contents, sub-contents, and learning outcomes. This will help show geometry as connected and coherent. It's essential to clearly define objectives, contents, sub-contents, and learning outcomes and to investigate their interrelations thoroughly.

Additionally, for the curriculum to be effective, it must provide comprehensive coverage of essential skills and knowledge, ensuring that the selected content is age-appropriate. It should also improve clarity regarding learning outcomes, specifying the concepts, conventions, techniques, results, and geometry processes intended for each content. Therefore, coherence is crucial; the curriculum should ensure that design, structure, and coherence, followed by the relation to domain, sub-domains, contents, sub-contents, and learning outcomes, are maintained within and across years.

3.2. Discussion

This comparative analysis between the Cambodian and Singaporean mathematics curricula, focusing on geometry, reveals critical differences in curriculum design, structure, and coherence. These should provide consistency in the intended direction of the curriculum by clarifying, developing and summing up the most important goals and missions of the teachers and school. This finding supports the suggestion that clear educational goals are essential for building coherence in the educational system (Fullan & Quinn, 2015; Newmann et al., 2001). These differences significantly impact the effectiveness of each system in promoting student learning outcomes, especially in geometry.

The result illustrated that the Cambodian curriculum emphasises practical application, critical thinking, and developing awareness of how mathematics is used in everyday life, aligning with national development goals. However, it faces challenges such as misalignment across educational levels and limited subject integration. In contrast, the Singaporean curriculum emphasises deep conceptual understanding, problem-solving skills, and metacognitive development, providing students with essential 21^{st}-century skills through a strong foundation approach. This result aligned with Schmidt et al. (2002), who found that logically organised curriculum contents and concepts built in relation from one grade to the next grade are crucial for effective learning because it ensures that students progressively develop their understanding and skills as

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they advance within and across the grades.

The different development of curriculum coherence in relation to contents and sub-contents for the Cambodian curriculum is not yet well constructed compared to the Singaporean curriculum. The Singaporean mathematics curriculum is a crucial example of strong curriculum coherence. The curriculum with a lack of coherence in relation to contents and sub-contents within the grade and across the grade level can make it difficult to see the connection between contents and understand how those concepts are related (NIE & PRI, 2021; Schmidt et al., 2002). It allows the students to progress in specific content knowledge from lower to upper grades (Schmidt et al., 2005).

A well-designed curriculum aligns its content with clear learning outcomes, ensuring that what students are taught directly contributes to their educational goals. The Singaporean mathematics curriculum is noted for its strong alignment between content, sub-content, and learning outcomes. The learning outcomes are clearly defined and carefully sequenced, guiding both teachers and students through a logical progression of skills and knowledge.

Conversely, the Cambodian curriculum struggles with coherence. In many cases, the learning outcomes in Cambodia's curriculum do not clearly correspond to the content being taught. This lack of coherence can lead to confusion in the classroom and may prevent students from fully mastering the concepts they need to succeed in mathematics.

The result is also supported by previous scholars who have indicated that the curriculum lacks coherence in terms of the relation to domain, contents, sub-contents, and learning outcomes do not correspond to each other, which can lead to the student's difficulty in understanding the geometrical concepts and tending to achieve low achievement (Cuoco & McCallum, 2018a; Prawat & Schmidt, 2006; Veasna & Baba, 2024).

The findings of this study suggest that improving curriculum coherence in Cambodia could lead to better student outcomes in mathematics, particularly in geometry. By adopting a more structured approach to curriculum design, similar to that of Singapore, Cambodia could ensure that students are gradually building their knowledge and skills in a logical and consistent manner.

Additionally, clear alignment between content and learning outcomes is essential for helping students achieve educational goals. If the Cambodian curriculum were to focus on better aligning its content with specific learning outcomes, it could make the learning process more transparent and effective for both teachers and students.

4. Conclusions

Curriculum coherence is crucial for improving student outcomes in mathematics, particularly in geometry. Through the comparative analysis, the Singaporean mathematics curricula are highly coherent in terms of design, structure, and coherence, followed by domain, content, sub-contents, and learning outcomes within and across the grade. It is well organised with a logical progression of geometric concepts that correspond with each other compared to the Cambodian mathematics curriculum, which lacks coherence and has significant gaps in how geometric concepts are introduced and developed.

The study suggests that Cambodia could improve its students' mathematical achievements by investigating a more structured and coherent approach similar

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to Singapore's. The findings offer valuable insights for countries facing similar challenges in curriculum design. Although this research is limited to comparing the curricula' overall structure and content relationships in the two countries through the intended curriculum, further studies should compare the implemented and attended curriculum to gain a deeper understanding of geometry concepts.

Author Contributions
The result of this finding is not only for the Cambodian context but can be used for other countries that have faced the same situation.

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Declaration of Competing Interest
This study belongs to the author. There is no conflict of interest for this study.

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