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► **To cite this version:**

Mehedi Hasan Anik. Comparison of NCTB Science Curriculum (2012) of Bangladesh Concerning Hong Kong's Science Curriculum. 2022. hal-04427430

HAL Id: hal-04427430

<https://hal.science/hal-04427430>

Preprint submitted on 30 Jan 2024

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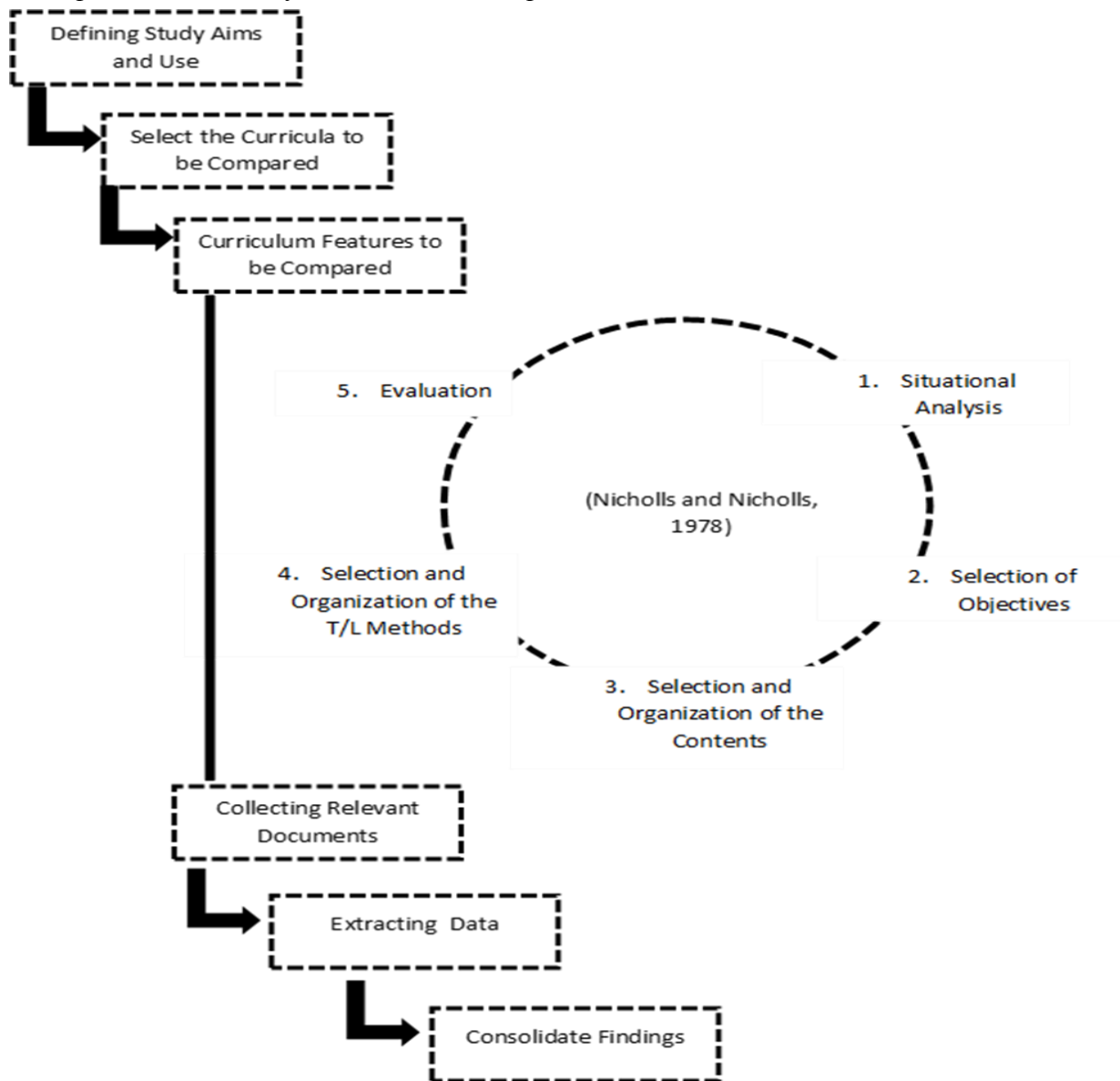
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Comparison Framework:

I have developed a conceptual framework for the comparison of the two curricula stressing the stages of the curriculum mapping method (Greator et al., 2019) and the idea from the cyclic model of curriculum development by Nicholls and Nicholls (1978).

Figure-01

Conceptual Framework for Curriculum Comparison.



The rationale of the Framework Chosen:

To compare two or more curricula at the same time, we need a systematic procedure of steps that may provide both the direction and the features or themes considering which the whole comparison will be made. Thinking in such a way, the conceptual framework has been developed considering the procedural steps explained in the curriculum mapping method (Greatorex et al., 2019), and the features have been undertaken from what Nicholls and Nicholls (1978) mentioned as the elements of a curriculum.

1. Defining the aims and purpose of the study: The first thing to do in curriculum mapping is to identify the aims and purpose of the study (Harden, 2001). Here, the purpose is to compare two countries' science curricula under similar features or themes for master's assignment purposes.
2. Deciding Which Curricula will be Considered: Out of many options, I have chosen the Hong Kong science curriculum to compare with the science curriculum of Bangladesh.
3. Determining the Key Features of Comparison: I have followed the curriculum development stages mentioned by Nicholls and Nicholls (1978) to set the themes under which the exact comparison was made. The features are- Situation Analysis, Selection of Objectives, Selection and Organization of Contents, Selection and Organization of the T/L method, and Evaluation.
4. Collecting Relevant Documentation and Sources of Data: Both curricula were found easily online. Again, some other supportive literature was also being collected and the references are also being added at the end of the assignment.
5. Extracting Data: I have undertaken thematic analysis as the data were collected under the themes, namely curriculum development stages by Nicholls and Nicholls (1978).
6. Consolidating Findings: The findings are well consolidated under the themes and further the explanation has been given in the next section as follows-

Comparison Based on the Features Chosen:

1. Situation Analysis:
There are similarities in situation analysis as both countries considered local, regional, and global aspects in designing their curriculums. Hong Kong seems to be more advanced in consideration as it undertakes STEM education, a method that considers more than one discipline of science during instruction and application. Hong Kong believes that the STEM approach to science education will help improve students' problem-solving skills, and ability to innovate, create, and apply the things learned in their daily life. This is what 21st-century education demands to create lifelong learners.
2. Selection of Objectives:
For Bangladesh, no specific aims for the science curriculum have been mentioned. But in general aims, it was mentioned to develop a scientific mindset through education which is somewhat similar to the 5 characteristics of scientific literacy addressed by Goodrum

(2008). If we see the scientific mindset as the end state, the 5 characteristics are what we need to insert into learners. Again, raising curiosity and interest is an important objective mentioned in the curriculum.

On the other hand, the Hong Kong science curriculum has specified aims that usher clearly to develop students' scientific literacy. The focus is on scientific values like curiosity, integrity, perseverance, cooperative skills, and many more. Therefore, the most important aspect of this curriculum is that it has mentioned nine generic skills under three domains basic skills, thinking skills, and personal and social skills. The nature of science is explicitly mentioned as one of the vital elements to teach which is absent in the Bangladeshi Science Curriculum.

3. Selection and Organization of the Content:

NCTB primary and secondary curricula have no specific content strands found. Topics tried to maintain spiral sequencing but in most cases failed (Bain & Siddique, 2017). Bain and Siddique (2017) also found irregularities in horizontal sequencing and coherence among chapters.

On the other hand, there are six specific key learning areas explicitly mentioned in the Hong Kong curriculum and the learning objectives are selected under these strands. These are- scientific investigation, life and living, the material world, energy, and change, the earth and beyond, and last but not least-science, technology, society, and environment. Specific objectives, also mentioned as specific learning targets are offered in two key stages for the primary level and other two stages for the secondary level.

For textbooks, Bangladesh offers general science from classes three to eight. In the first and second levels, no extra book is provided and a basic taste of surroundings, environment, matter, etc. is given through other subjects Bengali and English. For the secondary level (Class Nine and Ten), it offers two types of science books. Separate specialized books-Physics, Chemistry, and Biology for those who want to further study science and want to take science-related fields as professions. The other one is general science offered to the learners who choose humanities and Business studies. Many studies criticized it as lower science compared to the science offered to the science students. The structure is somewhat similar to those mentioned in Hong Kong's curriculum. It offers general studies at the primary level with science learning elements. The actual science contents are offered from the junior secondary level and the specialized subjects such as physics, Chemistry, and Biology are offered in an integrated manner.

4. Selection and Organization of the T/L Method:

NCTB curriculum (2012) emphasized hands-on activities, peer work, problem-based learning, question-answer, etc. methods as teaching-learning strategies to establish a sense of student-centered philosophy. Also, a great shift has been shown from

memorization tendency to student creativity and autonomy. However in terms of openness, Bangladeshi science classrooms are far behind (Siddique & Rahman, 2007). Like the NCTB curriculum (2012), the Hong Kong curriculum also refers to inquiry learning based on the constructivist philosophy. To aid in inquiry, scientific investigation, problem-based learning, etc. are what they have mentioned.

5. Evaluation:

NCTB curriculum (2012) emphasized two types of assessment strategies assessment and formative assessment. Summative assessment is supposed to be taken at the end of a term and there are two terms mentioned-mid and yearly. Despite the option of formative assessment, more emphasis has been given to summative assessments to determine whether or not the students have achieved the learning outcomes.

On the other hand, the Hong Kong science curriculum mentioned diagnostic assessment alongside formative and summative assessment. Formative assessment is also linked with the summative assessment to make the best outcomes from science education with the option for parents to play some roles, unlike in Bangladesh.

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