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Values Education and Global Citizenship towards Achieving the Sustainable Development Goals

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The **Journal of Southeast Asian Education** is an official Southeast Asian Ministers of Education Organization (SEAMEO) publication produced twice a year.

The main purpose of this international journal is to provide information and analyses to assist in policy-making and planning in the countries in the region. It promotes the interchange of ideas on educational issues and comparative studies, both within the countries of the region and other parts of the world. Each article in the journal was written to enable readers from outside each country to obtain an overview of how education is carried out outside its borders.

The theme of this special issue is "Values Education and Global Citizenship towards Achieving the Sustainable Development Goals (SDGs) and Promoting Humanities." It is a product of SEAMEO's collaboration with the University of Tsukuba. It features official contributions from four SEAMEO regional centres, namely, the Southeast Asian Regional Open Learning Centre (SEAMOLEC), the Regional Centre for Quality Improvement of Teachers and Education Personnel (QITEP) in Mathematics (SEAQIM), the Regional Centre for QITEP in Science (SEAQIS), the Regional Centre for Education in Science and Mathematics (RECSAM), the Regional Centre for Lifelong Learning (CELLL), and the Regional Centre for History and Tradition (CHAT). Other contributors also came from organisations such as the Centre for Research on International Cooperation in Educational Development (CRICED) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) Mahatma Gandhi Institute of Education for Peace and Sustainable Development (MGIEP). The various articles in this journal present projects and programmes focusing on values education and global citizenship in Southeast Asia.

The inaugural issue of the **Journal of Southeast Asian Education** was launched by the SEAMEO Secretariat in July 2000.

The designations employed and the presentation of the materials throughout the publication do not imply the expression of any opinion whatsoever on the part of SEAMEO concerning the legal status of any country, territory, city, or area, or of its authorities or frontiers or boundaries.

Contents

Foreword

The articles on utilising values education and global citizenship to achieve the SDGs and promote humanities featured in this journal highlight some of the highly effective initiatives undertaken by researchers from the University of Tsukuba and four of the regional centres of SEAMEO to improve lives across the region.

This journal, supported by the University of Tsukuba, presents good practices and examples of pioneering programmes that seek to provide recommendations and solutions to issues and challenges that address national, regional, and global educational concerns.

SEAMEO's motto, "Leading through Learning," reflects the organisation's leadership and commitment to promote quality education, science, and culture in Southeast Asia and beyond. Through the activities and strategies undertaken by its 24 regional centres, SEAMEO is able to reach out to diverse communities in Southeast Asia to contribute to the development of human resources (HR) and address challenging issues such as alleviating poverty, creating a better quality of life, providing educational equity and quality, enhancing agriculture and natural resources as well as health and nutrition, and promoting the dissemination and exchange of knowledge and learning of indigenous cultures and traditions.

We hope this journal serves as a source of learning and reference for educational institutions across Southeast Asia. We are also confident that it will help the general public better understand the nature of the work of SEAMEO, which will continually expand and grow as the organisation strides into a new stage of growth in the 21st century, described in our 10-year strategic vision as "The Golden SEAMEO."

The SEAMEO Secretariat would like to thank the ministers of education, senior officials, and centre directors of SEAMEO Member Countries for their commitment and unfailing support over the years.

We also wish to recognise the excellent cooperation we have received from the University of Tsukuba, SEAMEO regional centres, and other partner organisations. All of these efforts have, in one way or another, contributed to the completion of this journal.

Dr. Ethel Agnes P. Valenzuela
SEAMEO Secretariat Director

Introduction

The world has increasingly become interconnected aided by advancements in technology. As such, it has become necessary for countries the world over to reform educational systems to keep up with the wave of globalisation in the 21st century.

The SEAMEO Secretariat in collaboration with the University of Tsukuba has thus embarked on various projects and programmes to contribute to efforts towards achieving globalisation via improving values education throughout the Southeast Asian region.

Educational institutions worldwide have been teaching values education so they can produce future workers and citizens that do not only care about their own interests, but also about issues that affect the whole world. To get a glimpse of developments and progress in the field of values education in Southeast Asia and Japan, this journal features the following articles:

- **National Curriculum Reforms in Japan from 1998 to 2018: A CDA on the Possibility of Sustainable Development:** This article aims to prove that Yutori or relaxed education did not result in a decline in Japanese students' academic performance. It also hopes to defend the so-called "Yutori generation" from the criticisms that they have been dealt with over the years.

- **The Value of Studying Words and Deep Thinking Using Semantic Maps in a Japanese Reading Class:** This article aims to examine the effects, specifically positive effects, of creating semantic maps in small groups. It features instances of semantic map-making that positively affected Japanese middle-school students who used to have difficulty with understanding literary texts. It explains how students deepen their understanding of texts through the creation of semantic maps.

- **Global Citizenship and Deliberative Democratic Education: Focusing on the Controversy in Political Philosophy and the Philosophy of Education:** This article aims to clarify features of the educational-philosophical controversy on global citizenship and consider how students are taught about global justice and the value of deliberative democracy. It hopes to explore the ideal direction that citizenship education must take to respond to the call for globalisation primarily based on political philosophy and the philosophy of education and focusing on global justice and citizenship education. The featured study hopes to define global citizenship and identify ways to nurture it in students.

- **Issues and Expectations in Japan About Moral or Values Education:** This article tackles values education, which has a diverse range of meanings, depending on one's country, region, and person. In it, however, values education is a generic term that covers moral, religious, political, citizenship, character, and other kinds of education.

- **Seeking the Value of Mathematics Education:** This article aims to share the value of the Southeast Asian Basic Education Standards (SEA-BES): Common Core Regional Learning Standards (CCRLS) for Mathematics and Science in relation to mathematics education.

- **Values Education and Global Citizenship in Social Studies in Japan:** This article discusses how social studies classes integrated with values education can help develop a sense of global citizenship in students.

- **SDG 4.7: Fostering Global Citizenship:** This article discusses how SDG 4.7, which focuses on education for sustainable development (ESD) and global citizenship, is critical in achieving not only SDG 4 on education, but also achieving the other 16 SDGs.

- **Values Education and Global Citizenship towards Achieving the SDGs and Promoting Humanities:** This article presents a higher education capacity-building project funded by the Erasmus+ Programme of the European Union (EU)—Indoped. The featured project aims to modernise higher education in Indonesia via the adaptation of tried-and-tested European pedagogical approaches. By introducing and sharing different learning methods used by European university partners, the study hopes to add value to existing Indonesian pedagogical approaches to close the gap between what is taught in universities and what is required by industries.

- **Fostering Global Citizenship in Statistics Education:** This article discusses the development and implementation of a cross-border lesson on statistics in the context of energy conservation that aims to promote global citizenship through improving data literacy. English-speaking students from Indonesia and Thailand participated in the featured lesson via WebEx. Data analysis revealed that the use of real-life data, meaningful context, and cross-border collaboration in statistics has great potential to increase student engagement and nurture their sense of global citizenship.

- **The Ability of High-School Students to Solve STEM-Related Problems:** This article investigates students' ability to solve science, technology, engineering, and mathematics (STEM) problems through a quantitative study that provides detailed information on students' problem-solving ability. The students were tested on the four levels of cognitive dimension—understanding, applying, analysing, and evaluating. The study provided an overview of the students' ability to solve STEM problems and so is expected to serve as a reference for teachers when planning and designing their own lessons.

- **Role of SEAMEO RECSAM in Inclusive and STEM Education Development:** This article identifies SEAMEO RECSAM's role in developing science and mathematics education in Southeast Asia. It discusses how the centre stays at the forefront of pursuing the knowledge, skills, and values needed to effectively respond to changing global contexts, particularly with regard to the complexity of the Southeast Asian economic, sociocultural, and political environment, and develop teachers imbibed with the Association of Southeast Asian Nations (ASEAN) ideals to live in a harmonious community.

- **Lifelong Learning and Global Citizenship Education (GCED): The Perfect Combination for Future Global Citizens:** This article aims to present an overview of GCED and lifelong learning and their roles in today's world and how they can be combined to make every person a truly global citizen.

- **GCED and Skills Development:** This article discusses the changes that are affecting not just the Southeast Asian countries and region, but also the whole world. As global and regional event continue to disrupt the future, workers need to be imbibed with a broader range of skills to compete in the labour market.

- **How SEAMEO CHAT Adds Value to Education and Helps Foster Global Citizenship:** SEAMEO CHAT strives to incorporate history into school curricula to ensure the well-rounded education of global citizens. This article discusses how teaching history can add value to education and lead to fostering global citizenship in the so-called "digital generation."

Despite some progress in values education, countries have yet to realise its full potential to meet challenges such as increasing globalisation, bridging the 21st-century skills gap, resolving cultural and religious conflicts, eradicating inequality, and other issues. For initiatives to succeed, collaborating with the right partners and catering to the actual needs of the target beneficiaries must be met.

To learn more about the currently existing values education-related programmes and projects throughout Southeast Asia, read the articles in this journal. They feature experiences and good practices that other countries who wish to follow in their suit can gain insights from. They also highlight challenges that implementers may face and have to deal with. Be inspired by their endeavours and go on your own journey towards using values education as a means to meeting the challenges of the 21st century head-on in your country.

National Curriculum Reforms in Japan from 1998 to 2018: A CDA on the Possibility of Sustainable Development

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Abstract

In Japan, there is a concept of Yutori (relaxed) education. Yutori education refers to education that follows the national curriculum guidelines (or the Course of Study) revised in 1998. Although the guidelines in 1998 respected human nature, living together, and learning through problem solving, they have been criticised because Yutori education results in low academic ability, as the contents of the curriculum and number of lesson hours have decreased. In the mid-2000s, the term "Yutori generation" was also used, referring to the generation who learned according to the guidelines revised in 1998; this generation is regarded as selfish. However, this criticism is not accurate. Now, the Ministry of Education, Culture, Sports, Science and Technology (MEXT) is concerned that the criticisms from the Yutori education will once again arise. For that reason, the national curriculum guidelines that were revised in 2008 and again in 2017 have increased the number of class hours and do not fully emphasise learning through problem solving.

Introduction

The purpose of this study is to examine the validity of Japan's curriculum reform from 1998 to 2018, focusing on the concept of Yutori education, and to think about the possibility of the sustainable development of curriculum policy in the future. In this report, I first explain the criticism of Yutori education in Japan. Next, I point out that the criticisms about the Yutori education and the Yutori generation were incorrect. Then, I examine how the criticism about the Yutori education affected the revisions of the national curriculum guidelines in 2008 and 2017. Critical discourse analysis (CDA), which focuses on language and discourse created with a specific intention, is used in this study. CDA "has become one of the most influential and visible branches of discourse analysis" (Blommaert and Bulcaen, 2000:447) since the late 1980s. It is problematic that such language and discourse form a specific image that influences people's thinking, labels some people, and has a negative influence on policy formation.

National Curriculum Guidelines

The national curriculum guidelines establish standards for schools to develop a curriculum under the "School Education Act" to ensure a certain level of education nationwide. MEXT defines the national curriculum guidelines as: "broad standards for all schools, from kindergarten through upper-secondary schools, to organise their programmes in order to ensure a fixed standard of education throughout the country. In addition, the "Ordinance for Enforcement of the School Education Act" specifies the standard number of school hours for subjects, amongst other things. Based on these guidelines and the annual number of school hours and other requirements, each school develops a curriculum tailored for local and school conditions" (MEXT, "What Is the Course of Study?").

Revision of the national curriculum guidelines is announced and implemented after a thorough understanding of its objectives. The revision and implementation history of the national curriculum guidelines for elementary, junior-high, and senior-high schools in the Heisei Era is shown below. The year of revision here is described collectively for all school levels (based on the year for elementary schools, etc.).

Table 1: Revision and Implementation History of the National Curriculum Guidelines in the Heisei Era	
Year	**Details**
1989	Revised for elementary, junior-high, and senior-high schools • **Elementary:** Implemented in April 1992 • **Junior high:** Implemented in April 1993 • **Senior high:** Implemented in April 1994 (grade-based)
1998	Revised for elementary and junior-high schools • **Elementary and junior high:** Implemented in April 2002 Revised in 1999 for senior-high schools • **Senior high:** Implemented in April 2003 (grade-based)
2008	Revised for elementary and junior-high schools • **Elementary:** Implemented in April 2011 • **Junior high:** Implemented in April 2012 Revised in 2009 for senior-high schools • **Senior high:** Implemented in April 2013 (grade-based)
2017	Revised for elementary and junior-high schools • **Elementary:** For implementation in April 2020 • **Junior high:** For implementation in April 2021 Revised in 2018 for senior-high schools • **Senior high:** For implementation in April 2022 (grade-based)

Meaning of "Yutori"

"Yutori" is a common word, as in the expression "a comfortable (Yutori) lifestyle," and it generally has a positive meaning. It can be said to be a word reflecting an ability to afford something. For example, when I am busy, I could say, "There is no time or space (Yutori)." "Yutori" is a keyword referring to "youth theory" and "education theory" in Japan, and it is commonly used in terms such as "Yutori education" (relaxed or stress-free education) and "Yutori generation." These words have been coined through a combination of "Yutori + education" and "Yutori + generation," but in Japan, they are established as well-known phrases that hold a negative connotation. It is not uncommon to hear such statements as, "the Yutori education failed"; "the Yutori generation has low academic ability"; and "the Yutori generation is selfish." But are these true?

Definition and Criticisms of Yutori Education

Before answering this question, it is important to clarify the definition of Yutori education. Although there are various opinions on the scope of Yutori education, it can be said that it is referring to the education based on the national curriculum guidelines for revision in 1998. The full implementation of the guidelines was in 2002. The guidelines emphasise learning through problem solving and experiential learning. In addition, in accordance with the five-day weekly school system implemented in 2000, class hours were reduced and the curricular content was carefully selected. Some critics who responded negatively to this feature began criticising the national curriculum revised in 1998 by calling it "Yutori education," starting around 2000. The MEXT, in order to address the criticism of the Yutori education, increased the contents of education and class hours at the guidelines revised in 2008 and 2017 (see Tables 1 and 2). The revised national curriculum guidelines for 2008 were positioned as "reactionary" towards the revised guidelines from 1998. It cannot be denied that similar criticisms continue with the 2017 revised edition.

Table 2: Changes Made to the Standard Elementary-School Class Hours for All Grades

Revision Year	Japanese Language	Social Studies	Arithmetic	Science	Socio-environmental studies	Music	Arts and Crafts	Home Economics (HE)	Physical Education (PE)	Foreign Language	Moral Education	Special Activities	Integrated Study Period	Foreign Language Activities	Total Number of Class Hours
1989	1,601	420	1,011	420	207	418	418	140	627	0	209	314	0	0	5,785
1998	1,377	345	869	345	207	358	358	115	540	0	209	209	430	0	5,367
2007	1,461	365	1,011	405	207	358	358	115	597	0	209	209	280	70	5,645
2018	1,461	365	1,011	405	207	358	358	115	597	140	209	209	280	70	5,785

Table 3: Changes Made to the Standard Junior-High School Class Hours for All Grades

Revision Year	Japanese Language	Social Studies	Math	Science	Music	Art	Technology and HE (THE)	Health and PE	Foreign Language	Moral Education	Special Activities	Elective	Integrated Study Period	Total Number of Class Hours
1989	455	350–385	385	315–350	140–175	140–175	210–245	315–350	☆	105	105–210	350–630	0	3,150
1998	350	295	315	290	115	115	175	270	315	105	105	155–280	210–335	2,940
2008	385	350	385	385	115	115	175	315	420	105	105	★	190	3,045
2017	385	350	385	385	115	115	175	315	420	105	105	★	190	3,045

Note: A time unit is 45 minutes for elementary schools and 50 minutes for junior high schools. Time for special activities will be allocated to homeroom activities. The standard number of class hours for foreign language at junior high schools under the 1989 revision (☆) is 105–140 hours per grade as a selective subject. Selective subjects in junior-high school could be covered at a school's discretion and have not been eliminated under the 2008 revision (★). However, they might be difficult to cover in practice because of limited class hours.

What age group does the Yutori generation refer to? According to newspaper articles, this generation is delineated based on whether a student took university entrance examinations using the revised educational guidelines of 1998. Current first- and second-year undergraduates took an entrance examination for university based on the revised educational guidelines for 2008 for all subjects. Therefore, it can be said that the current first- and second-year university students are not in the Yutori generation.

Is Criticism of the Yutori Education Correct?

At Trends in International Mathematics and Science Study (TIMSS) of the International Association for the Evaluation of Educational Achievement (IEA), Japanese academic achievement levels have been high, including during the time when the students from the Yutori generation participated. TIMSS is designed to assess to what extent students have retained what they learned at school. Japanese students have taken the highest ranks in arithmetic, mathematics, and science, although there have been some fluctuations as the results of participating countries increase on each assessment.

At the Programme for International Student Assessment (PISA) by the Organisation for Economic Co-operation and Development (OECD), Japan students made up the top class in the 2012 survey. Students who took the PISA in 2012 were from the generation learning using the 1998 revised national curriculum guidelines, the so-called "Yutori education." In other words, there was no drop in academic ability due to the Yutori education. As for the score of PISA reading literacy, since there was fluctuation in the 2000s, the reason will be discussed below. I will consider the reason why the reading literacy scores were low in the 2003 and 2006 surveys, yet outstanding in the 2009 and 2012 surveys.

First, why then have the results of PISA reading literacy been at around the average level in the 2000s, particularly in 2003 and 2006? Or why did PISA mathematical literacy results seem lower even in the higher group than TIMSS results? The answer is simple. Japanese children had not gotten used to PISA-type questions. If they were asked to answer the problems that they had never learned, they would have no other choice than to give wrong answers or no answer because they failed to understand the points of the questions. It is well-known that PISA measures key competencies, which will enable them to participate fully and productively in adult life. This is a new view of academic ability to Japanese students. Although a new view of academic ability has been presented, the abilities to use skills and knowledge in real-life situations have not been taught in Japan. That is why Japanese children may have failed to fully understand the intention of the questions in the PISA reading literacy test and consequently showed poorer-than-expected results.

Second, why then did Japanese reading results rise in the 2009 and 2012 tests? Because schools started to give PISA-conscious lessons. After Japan received unfavourable results on the 2003 and 2006 PISA, schools started to give Type A questions (basic knowledge) and Type B questions (ability to think, judge, and express using knowledge) in the National Assessment of Academic Ability (for 6th graders and 9th graders; Japanese language and arithmetic/mathematics (science from 2012) starting in 2007. Type B questions are PISA-type questions, and thus reportedly have greatly affected the front line of education (Sato, 2016). Soon after that, lessons reflecting PISA-type questions have spread widely in junior- and senior-high schools.

The generation raised under the 1998 revision has been criticised as a Yutori generation whose academic standards went down under Yutori education. However, a closer look at TIMSS and PISA results finds such a logic unreasonable. Since their academic abilities have not declined, the negative usage of "Yutori education" and "Yutori generation" turns out to be quite contrary to fact.

Is Criticism of the Yutori Generation Correct?

The Yutori generation has been widely criticised. Although it is difficult to explain the characteristics of the young generation, Furuich (2011:73–75) has made the following points based on the "public opinion survey on social consciousness" of the Cabinet Office:

> *Do you always want to be useful for society as a member of society? This question has been consistently asked in the survey. According to the 2012 survey, 59.4% of young people in their twenties are hoping to serve society. In the 1983 survey, only 32% answered that they wanted to serve society in their twenties. That means that in less than 30 years, the number of young people who really want to serve society has doubled. Contemporary young people are not just 'society-oriented,' but also want to contribute to society.*

From here, we can see the young generation's interest in public contribution. This may be the result of a variety of background factors, but if we focus on school education, it can be considered to be the result of the 1998 national curriculum guidelines that strove to overcome competitive education and emphasised human nature, living together, problem solving, and experiential learning. In other words, criticism of the Yutori education and the Yutori generation is not appropriate; instead, it can be said that it is a factual misunderstanding.

How Did the Criticisms Lead to the 2008 Revision?

The negative impact of Yutori criticism in the development of curriculum policy still exists. Since the MEXT is concerned about the re-occurrence of the criticism towards the Yutori education, its only option is to increase class hours and educational content. In short, because of the discourse surrounding the Yutori education, MEXT cannot freely develop curriculum policy. After the revision of the curriculum guidelines in 2008, the quantity of homework assignments and learning drills increased. Since the curriculum that was taught in the upper grades was moved to the lower grades, unreasonable learning expectations that are incompatible with developmental stages were raised. At the same time, various problems concerning children's growth have arisen. For example, according to the MEXT "Final Report on Support to School Refusing Students" (Study and Research Collaborators Meeting on School Refusal, July 2016), the number of schools refusing pupils increased for the first time in six years in 2013 (in academic year [AY] 2014, 0.39% of elementary-school children and 2.76% of junior-high-school students do not attend school). The current National Curriculum Guidelines have made educational content too difficult, and students are busy everyday. Should the national curriculum guidelines be considered as one of the background factors of the high proportion of school refusal?

How Did the Criticisms Lead to the 2017 Revision?

The 2017 revision did not reduce study content. It maintained the number of class hours, and even increased class hours in elementary schools. The 2008 revision had created certain problems, including an increased number of class hours, a focus on drill work, increased homework, the use of units unsuitable for the students' developmental stages, and a "crowded curriculum." The guidelines that were revised in 2017 did not solve any of these problems. Thus, the coursework might not all fit into the allotted time. As a matter of fact, some boards of education have even proposed a "shorter summer holiday." The main reason behind these policies that focus on "total volume" and "increased content and class hours" is that MEXT has gone on the defensive; they fear the revival of the criticism of the Yutori education that the 1998 revision might have caused academic decline. However, that criticism was mistaken. The 1998 revision did not advocate for children being relaxed, but rather should have been considered as promoting learning through problem solving and living together.

Conclusion

From an international perspective, the Japanese curriculum policy has problems. In order to realise a competency-based curriculum for a knowledge-based and global society, OECD suggests that increasing the number of class hours is inappropriate; instead, deep learning is important (Taguma, 2015). Mochizuki (2018) who is a Head of Programme, Curriculum, UNESCO MGIEP mentioned that humanity should be respected rather than economic competition. Is the current curriculum of Japan keeping students busy, competing to exclude them from 21st-century learning? Internationally, is there any possibility that the Japanese education will become obsolete? In order to maintain the possibility of sustainable development in the curriculum, discourse such as the criticism of Yutori education should be abolished. Constructive discussion over education is the first step in policy formation that will lead to sustainability.

The ideas of Yutori education and Yutori generation, as discussed in this article, have no substance and evidence; in addition, they have tarnished the image of many young people. The 2008 revision of the national curriculum guidelines, developed as a reaction to these negative ideas, seems to have forcibly moved some educational units from upper grades to lower grades. This can result in social problems like insufficient understanding or bipolarisation of academic abilities. The groundless criticism against Yutori education and the Yutori generation had ripple effects on the 2008 revision and, consequently, on children.

These ideas are groundless and empty and should no longer be used. As today's values diversify, it may be unreasonable to categorise all of those people born in the same period as one generation. A one-sided remark such as "your generation is characterised by "xxx" easily spreads a collective image of a generation with no respect for individuality. As a result, the stereotypical view of a generation prevails throughout society, making those in the generation feel like "that's not who I/we really am/are" or "it's difficult to live like that." These negative feelings are far from productive. Here, the author wants to suggest the idea of being "generation-free."

"Generation-free" refers to being "free from a generation label and any words that spread its stereotypical characteristics." The idea of generation-free specifically aims to free the population from groundless and improper words and remarks about generations, as well as simplified conceptions of those generations. This can liberate us from the pattern of seeing one single generation in a collective and fixed manner, and to instead pay attention to the intentions and needs of individuals and different categories (e.g., groups with the same interests that transcend generations), thus enabling us to generate new concepts, viewpoints, and ideas. This action will even lead to new market development, new places of belonging, and new business team formations, as well as intergenerational coexistence, ultimately leading to a renewed and revitalised society. Whether looking at business, policy-making, academic research, or community activity, going beyond a generational framework and instead exchanging ideas about particular themes is expected to improve the activity's quality.

Realising a generation-free society requires the ability to view generation-related remarks objectively and properly disassemble them. What can be done to determine whether particular words are improper? Answering the questions of who, what, where, when, and how is important (Ikemizu, 2007:134). In addition, the author wants to emphasise the critical importance of the "power of knowledge," specifically a breadth of vision, scholarly attainments, and the ability to research. When each of us learns to make more proper judgments, we can look critically at any argument.

Francis Bacon, the English philosopher, listed human mistakes (fallacious ways of thinking, preconceptions, and prejudice) that he called "the four idols." Idols of the tribe are mistakes based on human sensory illusion. Idols of the cave are mistakes caused by personal experience, habits, character, or living environment. Idols of the market are mistakes caused by improper words and expressions that spread where people gather. Finally, idols of the theatre are mistakes caused when people consider tradition, authoritative ideas, and doctrines to be absolutely correct. Based on this logic, the mistakes of the Yutori education and the Yutori generation largely correspond to the idols of the market and theatre. We need to be conscious of these perceptional mistakes that were highlighted by Bacon, and squarely face them on a daily basis. Such accumulated efforts should definitely get us closer to a generation-free society.

Note: This article is an English summary of "How Has Criticism of the Relaxed Generation Been Made?" published in Japanese in 2014, which was co-authored with Tomochika Okamoto, this article but summarises and revises Hiroshi Sato's section. The book was introduced for discussion at SEAMEO and this theme attracted attention at the International Conference in Tokyo on 11 February 2018. This article was written in English to discuss "criticisms of Yutori education" internationally, especially with SEAMEO researchers, policy-makers and educators.

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The Value of Studying Words and Deep Thinking Using Semantic Maps in a Japanese Reading Class

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Abstract

The main purpose of this study is to examine the effects, specifically positive effects, of creating semantic maps in small groups. Included in this examination are the features of semantic map-making that enable positive effects on Japanese middle-school students who are having difficulties in understanding Japanese literary texts. To address these issues, this article explains how students deepen their understanding of the texts through the creation of semantic maps. According to the research, the students were able to receive different types of assistance from peers and teachers through semantic map-making. As a result, students could read literary texts using all four levels of thinking and learn word meanings beyond their dictionary definitions. Moreover, from the viewpoint of values education, semantic map-making (along with other techniques) could function as a tool for understanding others with different opinions.

Introduction

The MEXT has set five goals for Japanese language instruction (Ukida, 2010:369):

1. To develop the ability to fully express one's thoughts and to understand others' thoughts in Japanese

2. To improve communication skills

3. To develop the ability to think and imagine

4. To improve a sense of language

5. To deepen interest in the Japanese language and nurture an attitude of respect for the Japanese language

This study is based on the first and third goal above. The reason to focus on goal 1 is that when one is interpreting literary texts, there is no correct answer, just like with many problems in the real world; thus, it is important to understand that there are multiple answers or opinions. Likewise, goal 3 should be focused on in order to develop student's individualistic thinking and imagination when reading literature by going beyond what's written in a textbook. By doing so, they will have the ability to cooperate with others and solve potential problems they may face in the future.

To achieve these goals, this study incorporated semantic map-making into a Japanese reading class. Semantic maps are also called "webbing," "concept maps," or "mind maps." The goal is to let students visualise text information by connecting words with links (see Figure. 1). In other words, students transform text information into graphical information.

Figure 1: Sample semantic map created by students

The reason for incorporating semantic map-making is that it changes a traditional Japanese class, which would be typically be taught by "mass teaching" (Yamaguchi, 2010:349). In Japan, school education law requires Japanese classes to use textbooks approved by MEXT. For this reason, most students in Japanese classes have few opportunities to participate in discussions with other students. For example the following instruction, is a typical activity in a Japanese class (Katsuta and Iida, 2014):

1. The teacher sets learning goals to improve the students' literary reading skills. Students are taught to integrate information from two different texts.

2. The students read literary texts in textbooks and supplementary materials such as authors' biographies.

3. Students write an essay about what they have read.

4. Students present what they have written to the whole class.

There is a problem with this type of lessons. If students can read literary texts by themselves and understand reading skills immediately after the teacher's explanation, then this teaching style is effective. However, some students cannot understand textbooks by themselves. Those students will need more guidance or discussion with other students. However, traditional Japanese classes tend to have limited interaction between teacher and students, and much less interaction amongst the students.

There are hypothetically two advantages of semantic map-making. First, group semantic map-making fosters discussion on the theme of the story, the setting, the plot, and the characters. Second, semantic map-making makes it easier for teachers to help students, because it allows the students to create a record of their literary understanding.

The purpose of this article is to prove these hypotheses. In particular, I focused on one student who is not good at reading and writing to describe how he gained a deeper understanding of literary texts using semantic map-making. In addition, this article also describes how he had learned word meanings beyond their dictionary definitions, as well as how his beliefs changed.

Research Methodology

Overview of the Japanese Lesson Used in the Study

The lesson for this study has 11 sessions (one session = 50 minutes). The students read two literary texts. One is "My Old Home" (Xun, 1921 and 2009) in the textbook, which most Japanese students read in junior-high school. This short story examines the narrator's hope that Chinese society will become better in the future. The other one is "Mr. Fujino" (Xun, 1926 and 1956), written by the same author and covering a similar theme, but it is not in the textbook. Table 4 shows the main activities of this lesson.

Table 4: Main Lesson Activities	
"My Old Home"	**"Mr. Fujino"**
1. Read the story.	6. Read the story.
2. Write an essay about it.	7. Write an essay about it.
3. Make a semantic map of the story individually.	8. Make a semantic map of the story individually.
4. Make a semantic map of the same story with peers.	9. Make a semantic map of the same story with peers.
5. Rewrite your essay using the information from both semantic maps.	10. Rewrite your essay for "My Old Home" to include "Mr. Fujino" using all of the semantic maps.

A Focus on Group and Students

The lesson I observed focused on a small group, which included Koda, Hada, Saeki, Miyoshi, and Sato (all students' names are pseudonyms). Koda has strong reading, writing, and leadership skills, and scored perfectly on his national standardised test. Students in Koda's group usually consulted him when they had difficulties in understanding tasks or lectures, and asked him to present their semantic maps to the whole class. Hada has average reading and writing skills. Saeki and Miyoshi have the lowest reading and writing skills and rarely participated in group work. Therefore, they did not contribute enough to group work. Although Sato's reading and writing skills are also below-average, he participated actively in class; the number of Sato's utterances was the highest in the small group. For this reason, this research will focus on Sato.

Research Data Collection and Analysis

Every student's written response to the literary texts (essays and semantic maps), along with Sato's interactions with other students and the teacher were gathered for analysis. Students' essays were analysed and grouped into four levels of thinking (see Table 5). The protocols of Sato's interactions with others were coded by two researchers to identify the types of assistance he received from others.

Table 5: Sato's Performance in the Four Levels of Thinking	
Level of Thinking	**Definition**
Factual level	Involved with memory and recall of information from text
Interpretative level	Involved with drawing inferences about and reorganising text
Applicative level	Involved with integrating text with prior knowledge
Transactive level	Involved with affectively responding to text

Source: Ruddell, 2009:125–126

Research Results and Findings

The results of the data analysis showed that Sato had a better understanding of the two literary texts after using semantic map-making activities.

Analysis of Sato's Essays Before and After Semantic Map-Making

In the first essay, Sato did not understand any of content of "My Old Home." He simply wrote, "the sentences are too long. I don't understand the meaning of the texts." After the teacher encouraged him to elaborate, Sato added some text and showed that he understood the basic meaning of the story such as the fact that it was set in China. However, Sato only used the factual level of thinking. After Sato made a semantic map about "My Old Home" in his group (see Figure 2), his understanding of the story improved. For example, he mentioned a metaphor in his second essay on "My Old Home": "I think that the cold weather and the leaden sky represented the narrator's depression." That means he made inferences about the story's meaning beyond the literal meaning of the text (the interpretative level of thinking). In addition, he integrated the story's theme into his prior knowledge: "I think 'hope' is just like a path, so we have to make one for ourselves." That is, he used the applicative level of thinking after the semantic map-making activities.

Figure 2: Sato's group's semantic map of "My Old Home"

Furthermore, in the essay he wrote in the last session, he connected the story more directly to his own life (the transactive level of thinking):

> " *Mr. Fujino hopes Lu Xun could bring modern medical science back to China and develop it. Such an act will require a lot of effort. I think 'hope' is just like a path. We make one for ourselves and this requires effort. It takes effort to be smart so I'll try my best. We can do anything if we try hard so I'll try my best.* "

In other words, in the end, he used all four levels of thinking to understand "My Old Home" and "Mr. Fujino." Although his final essay was not as good as that of his peers, the progress Sato made was beyond everyone's expectation.

Analysis of Sato's Interactions with His Peers and the Teacher During the Semantic Map-Making

Based on his essays, we saw that Sato deepened his understanding as the lessons proceeded. The results of coding the protocols of Sato's interactions with his teacher and other group members showed that Sato received eleven different types of assistance in two categories—affective and cognitive (see Table 6).

Table 6: Types of Assistance That Sato Received	
Affective Assistance	**Cognitive Assistance**
I-A. Facilitating on-task behaviour The teacher and his group mates encouraged him to keep doing the tasks every time he got distracted.	**II-A. Teaching individual words** He asked the teacher and his group mates what unfamiliar words meant.
I-B. Obtaining praise and rewards The teacher and his group mates affirmed his performance.	**II-B. Setting** The teacher and his group mates told him where and when the events in the story took place.
	II-C. Characters He discussed who the characters of both stories were, including their relationships, feelings, and appearances, with the teacher and his group mates.
	II-D. Plot He discussed the plot of both stories, including what happened to the characters and their conversations with one another, with the teacher and his group mates.
	II-E. Theme He discussed the theme with his teacher and group mates, particularly what "hope" and "change" represented in the stories.
	II-F. How to create a semantic map The teacher and his group mates told him how to create a semantic map, including advice such as using different pen colours for emphasis, paying attention to common words used in both stories, and using wavy lines to distinguish his opinions from actual story content.
	II-G. How to write an essay The teacher explained specific writing techniques such as how to properly cite quotations.
	II-H. Rules for conducting small-group discussions The teacher intervened to resolve potential issues amongst the members of each small group. She encouraged all members to state their opinions during discussions.
	II-I. Building the story's image The teacher and his group mates helped him visualise the story's world. For instance, they asked him what his interpretation of the "leaden sky" was.

Semantic map-making was the reason that Sato could receive various kinds of assistance. First, the semantic map makes it easier for the teacher to help the students because it creates a visual of the students' problems. For example, Sato's struggles clearly appeared on his semantic map when connecting the two short stories because he did not write anything on his map. When the teacher saw this, she talked to Sato and elicited the similarities from both stories: "The characters in both stories, especially Mrs. Yang from 'My Old Home,' were foolish." After that, the interaction shown in Table 4 occurred, and Sato decided on the centre word "change" as shown in Figure 3. This helped Sato to analyse how other characters changed in both short stories. In other words, Sato, who has difficulties understanding Japanese literary texts, gradually formed his understanding through making semantic maps and interactions with others.

Teacher: Did she say such things at the beginning? Do you remember how she used to be?
Sato: Hmm. An old lady.
Teacher: Huh-uh.
Sato: A tofu seller.
Teacher: A tofu seller. Yeah. Komachi (Japanese ancient poetess known for her beauty).
Sato: Komachi
Teacher: Yeah. You like komachi.
Sato: Oh no no komachi
Hada: (laughing)
Teacher: See? Komachi is used to describe a beautiful lady, isn't it?
Sato: Was she cute?
Teacher: She was. That's why many people bought tofu from her store, didn't they? What about now?
Sato: She got old.
Teacher: She got old. It is one possible reason. But there are other reasons.
Sato: Compass?
Teacher: Her legs look like a compass and she demanded that the protagonist give her things in his home. In other words, she...
Sato: She changed.
Teacher: She changed.
Sato: So, I will choose change as a center word.

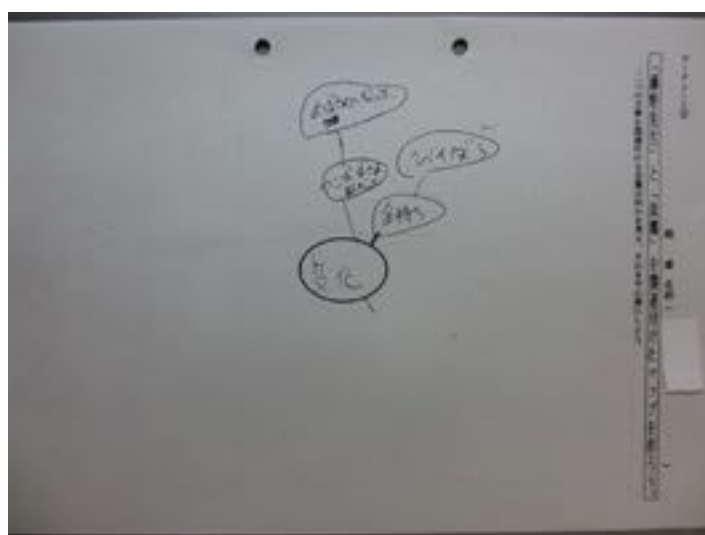Figure 3: Record of Sato's dialogue with his teacher

Figure 4: Sato's semantic map on what connected the stories

Semantic map-making also fosters story discussion at a deeper thinking level. As mentioned above, Sato decided the word "change" as a centre word but Sato's group's highest achievement student Koda decided the word "hope" as the centre word. For this reason, there were long interaction in Sato's group during 9th lesson to decide the centre word. This interactions was important for Sato because he realised why "hope" could be the centre word, and it made Sato think about the relationship between "hope" and "change" and their meaning in the two stories as shown in Figure 5. As a result of these discussions, he used all levels of thinking in his essay about two stories as I mentioned in the analysis of Sato's essays.

Koda: I think hope is best as the center word.
⋯ (omission)
Koda: Hope.
Sato: Hope? (To Hada) He said hope.
Koda: We can extend change from hope.
Sato: (To Hada) What did he say?
Hada: Can we extend change from hope?
Sato: Do you think we can do that? Isn't it XXX? (inaudible)
Koda: No.
Sato: Does it make any difference?
Hada: No it doesn't.
Sato: Then isn't it better to extrapolate hope from change? Or hope from Lu Xun?
Hada: It seems strange to extend change from hope.
Sato: Hope and change. Hope means having a dream. So it's not change.

Figure 5: Sato and Koda's dialogue on the central theme of the two stories

Conclusion

This article described how a Japanese middle-schooler was able to deepen his understanding of Japanese literary texts through the creation of semantic maps in his group. The main advantage of this type of lesson was that Sato received 11 types of assistance through both semantic map-making and essay writing. By doing so, Sato could learn to participate in all levels of thinking to understand literary texts and word meanings beyond their dictionary definitions. This advantage is due to the main feature of semantic map-making—students write down their understanding of the text on the map by linking words. Because of this feature, Sato's level of understanding and difficulties were clearly shown.

In addition, semantic map-making also fosters students' discussion at deeper thinking levels by encouraging them to consider keywords in the story, such as when Sato and Koda had different opinions about the story's keyword. From the viewpoint of values education, this means that semantic map-making, along with other activities could function as a tool to help students to understand different opinions.

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Global Citizenship and Deliberative Democratic Education: Focusing on the Controversy in Political Philosophy and the Philosophy of Education

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Abstract

Global citizenship is "a contested concept in scholarly discourse, and there are multiple interpretations of what it means to be a global citizen" (UNESCO 2014:15). This article aims to clarify features of the educational-philosophical controversy on global citizenship and consider how students are taught about global justice and the value of deliberative democracy. That intends to articulate the challenges that must be overcome in developing citizens who can live fully in the global world. For these aims, John Rawls, Thomas Pogge, Onora O'Neill, Martha Nussbaum, Anthony Appiah, and Amy Gutmann are mainly focused.

This article has four parts. The contents are as following: the trends of citizenship education in Japan; the controversy on global justice in political philosophy; global (cosmopolitanism) citizenship and national identity; and the needs for deliberative democratic education.

Introduction

The purposes of this article are to clarify features of the educational-philosophical controversy on global citizenship and to consider how we teach students global justice and the values of deliberative democracy.

Since 1998, when the course of study was revised, we have aimed to foster in students a zest for life (ikiru chikara) in Japan. A zest for life is a comprehensive ability that consists of solidly acquired basic and fundamental knowledge and skills, morality, and sound body. It is necessary for future citizens to live a good life and to use acquired knowledge and skills to solve many problems in this complicated and rapidly changing world. One such problem might relate to globalisation.

In parallel with these educational trends, citizenship education has been receiving considerable attention in educational studies and practices. In response to the realisation of the voting rights for 18-year-olds accompanying the revision of the "Public Offices Election Law" in 2015, citizenship education in schooling has been considered as a subject of ideal educational studies. However, there is a gap between these studies and educational practices. It seems that the study of citizenship education in Japan is still in the developing stage.

Thus, this article aims to explore the ideal direction of citizenship education in response to globalisation, based mainly on political philosophy and the philosophy of education on global justice and citizenship education. Through this examination, I would like to answer the question: "What is global citizenship and how do we nurture it in our students?"

The Trend of Citizenship Education in Japan

The next school curriculum guidelines at the high-school level was announced in March 2018. During the planning process for the revision of the next school curriculum guidelines, contents of the new subject, the public (civic education named "kokyo") had been explored. As the summary report indicates, in the next course of study at the high-school level, the purpose of civic education is described as follows (MEXT, 2016:4):

> **"** *To cultivate the dispositions and abilities needed for a citizen who can be a significant creator of a peaceful and democratic nation and society, and subjectively live in the global society.* **"**

The present guidelines of social studies, geography and history, and civics show the direction of emphasising further development of students' social views and thinking. The next guidelines clarify the specific desired characteristics of social perspective and manner of thinking. "The social perspective and manner of thinking refer to the viewpoints and methods that are needed in activities to pursue social issues and solve social problems, to consider the meaning and significance of social events and their characteristics or mutual relationships, and to understand the problems seen in society and to conceive of solutions." This social perspective and way of thinking are "indispensable to cultivate thought and judgment skills for the realisation of deep learning, as well as to acquire effective working knowledge." To foster these talents in the new subject of the public, it is desirable that teachers teach students through activities that help them gain an understanding of social issues, focusing on diverse perspectives of multiple concepts or theories related to ethics, politics, law, and economy. In addition, in order to deepen students' awareness about the ideal of a better society and the role of human beings within it, they will be required to teach students how to live and associate with ideas and theories that contribute to judgment for problem solving (MEXT, 2016:3).

The summary report also indicates the educational goals of the public. It is specified that teachers need to nurture dispositions and abilities related to sovereignty in the global world as follows. First, to nurture an attitude for thinking about society, human beings, events, and tasks related to the students' way of life, and to help them pursue ambitious tasks to discover the appropriate paths. Second, to nurture a willingness to form a better society through their activities for finding various problems that exist in society and prevent the realisation of a better society, to actively consider and conceive solutions to the problems in collaboration with others, and to participate in society by explaining and discussing the problems based on logic and reasoning. And third, to cultivate an awareness about how to live in modern society or how to live as a human being, to foster an inclination to love our own nation-state and to pursue its peace and prosperity, and to develop an awareness of the importance that all nations mutually respect each other's sovereignty and all citizens cooperate with each other, through multi-faceted and multi-lateral considerations and a deep mutual understanding (MEXT, 2014:16). In this, it is suggested that students will be asked to think first about their nation in the global era. Thus, our present tendency to educate global citizens might restrict the development of global thinking in students.

Asian countries, similarly to Japan, are promoting curriculum reform, introducing new views on academic ability and new forms of teaching and learning, and are also promoting citizenship education. However, as Yuto Kitamura insists, there is an implicit political intention that the state keep the social order and educate citizens to submit to the state in Singapore and Hong Kong (and, it follows, in Japan) (Kitamura, 2016:105). In this sense, our present intention to educate global citizens might restrict the development of global thinking in students.

Facing the rapid progress of globalisation, we Japanese taught students about the way of life in the global world under the name "education for international understanding (EIU)" until the 1990s. Multicultural education has also been introduced in educational practices. Multicultural education is "an educational ideal aimed at the coexistence and mutual prosperity of diverse racial, ethnic, and cultural groups from the viewpoint of minorities and the standpoint of social justice, accompanied by educational practice and the educational reform movement" (Matsuo, 2010:158). Ideally, what is sought is that multicultural education will be developed in the context of social justice. Unfortunately, this ideal has not yet been achieved. Here, I would like to consider social justice in the global society, that is, global justice.

The Controversy on Global Justice in Political Philosophy

In modern political philosophy, philosophers have argued about global justice over John Rawls's theory of justice. Rawls derived two principles of justice (principle 1: the liberty principle; 2-a: the different principle; and 2-b: the fair equality of opportunity principle) for forming a fair or cooperative and just society in **A Theory of Justice** (1976).

Rawls describes these principles as follows (1999a:226):

FIRST PRINCIPLE

Each person is to have an equal right to the most extensive total system of equal basic liberties compatible with a similar system of liberty for all.

SECOND PRINCIPLE

Social and economic inequalities are to be arranged so that they are both: (a) to the greatest benefit of the least advantaged, consistent with the just savings principle and (b) attached to offices and positions open to all under conditions of fair equality of opportunity.

His claim for universal principles shrank in his later work as described in **Political Liberalism** (1993) but he tried to expand liberal principles to global justice in **The Law of Peoples** (1999).

In **The Law of Peoples**, Rawls formulates eight principles that regulate the international interactions of people as follows (1999b:37):

1. Peoples are free and independent and their freedom and independence are to be respected by other peoples.

2. Peoples are to observe treaties and undertakings.

3. Peoples are equal and are parties to the agreements that bind them.

4. Peoples are to observe a duty of non-intervention.

5. Peoples have the right of self-defense but no right to instigate war for reasons other than self-defense.

6. Peoples are to honour human rights.

7. Peoples are to observe certain specified restrictions in the conduct of war.

8. Peoples have a duty to assist other people living under unfavourable conditions that prevent their having a just or decent political and social regime.

Amongst these principles, the sixth is about respect for human rights and the eighth is about the duty for assistance. Rawls referred to the duty for assistance in other parts as well saying (199b:106), "The long-term goal of (relatively) well-ordered societies should be to bring burdened societies, like outlaw states, into the society of well-ordered peoples. Well-ordered peoples have a duty to assist burdened societies." It can be said that Rawls assumes that the subjects of global society are well-ordered, just governance and morally characterised people (Rawls 1999b: 25–27 and Kamishima, 2015:60).

Though Rawls's **The Law of Peoples** has been both supported and criticised, Thomas Pogge, who is a critical successor of Rawls, developed a theory of global justice from a stand of resourcism. Pogge criticises that Rawls thinks international injustice is attributable to different levels of cultural politics in each state rather than to differences in the amount of resources held. His awareness of global injustice is based on a global economic system that unjustly creates persistent global poverty. Pogge (2008:177) claims an institutional concept of moral cosmopolitanism and the justification of "the duty towards every other not to cooperate in imposing an unjust institutional order." Opposing the notion that a shared responsibility for the justice of social institution cannot extend beyond national institutional order, Pogge (2008:178–179) clearly stated:

> *The existing global institutional order is neither natural nor God-given, but shaped and upheld by the more powerful governments and by other actors they control (such as the EU, North Atlantic Treaty Organization [NATO], the United Nations [UN], the World Trade Organization [WTO], OECD, the World Bank [WB], and the International Monetary Fund [IMF]). At least the more privileged and influential citizens of the more powerful and approximately democratic countries then bear a collective responsibility for their governments' role in designing and imposing this global order, and for their governments' failure to reform it towards greater human rights fulfillment.*

Onora O'Neill also criticises Rawls, claiming that his "account of global justice remains an account of 'international' justice, in which the supposed legitimacy of assigning control of bounded territories to 'peoples' is presupposed, and limits and perhaps undermine his arguments for justice beyond borders." For O'Neill (2016:164–165), Rawlsian global justice is insufficient because the primary agents of justice are assumed to be the states. She claims that there are "many bad states, many weak states, and many states too weak to prevent or regulate the activities of supposedly external bodies within their borders" (2016:162); it is not enough to view states as primary agents of justice. Thus, she supposes that a non-state institution and non-state actors (e.g., trans-national corporations [TNCs] and non-government organisations [NGOs]) are agents of justice.

Through examination of the political-philosophical controversy on global justice, recent philosophical trends might reflect that when we consider the essence of global justice, it is necessary to think about relativising the states, and to position individuals as agents of global justice. We can also say that global justice aspires to override the global issues that stem from states, depending on the individual power or forming fair institutions, and that global citizenship is the ideal goal for a citizen who can think about global justice without being held back by their own state's interests.

Global (Cosmopolitan) Citizenship and National Identity

Within the philosophy of education, philosophers discussed global citizenship in the late 1990s. This discussion consisted of Martha Nussbaum's claim of cosmopolitan education as well as its critiques.

Nussbaum, who is famous as a cosmopolitan philosopher, questioned (Nussbaum 1996:6), "Most important, should they (students) be taught that they are, above all, citizens of the U.S., or should they instead be taught that they are, above all, citizens of a world of human beings, and that, while they happen to be situated in the U.S., they have to share this world with the citizens of other countries?" She supports the latter, "cosmopolitan education" as she called it, and indicates four reasons for her support. Through cosmopolitan education, (1) we learn more about ourselves; (2) we make headway solving problems that require international cooperation; (3) we recognise moral obligations to the rest of the world that are real and that otherwise would go unrecognised; and (4) we make a consistent and coherent argument based on distinctions we are prepared to defend (Nussbaum, 1996:11–15).

Nussbaum does not reject nationalism in education because she thinks its proponents make a weak concession to cosmopolitanism. For example, Nussabum (1996:5–6) says they argue that "a commitment to basic human rights should be part of any national education system and this commitment will, in a sense, hold many nations together." However, she claims that that is not enough.

As a critic of Nussbaum's cosmopolitan thought, Anthony Appiah (1996) claims the notion of cosmopolitan patriot. Appiah considers citizens of the world (cosmopolitan citizens) to face a danger of unification of cultural differences and supports cosmopolitan patriots from the standpoint that global thinking is possible while respecting differences.

From a different standpoint, Amy Gutmann (1996:68) criticises Nussbaum's claim that our "allegiance is to the worldwide community of human beings," saying:

> ❝ *We have duties to respect the rights of individual human beings the world over, and schools the world over should teach children (not indoctrinate them) to appreciate these duties. But it does not follow that we are 'citizens of the world' or that our 'fundamental allegiance' is to the community of human beings in the entire world. This cosmopolitan position might be attractive, were our only alternative to give our primary allegiance to the U.S.A. or to some other politically sovereign community. But we have another alternative, which Nussbaum neglects (and does not recognise as the position defended by democratic humanism)—to reject the idea that our primary allegiance is to any actual community, and to recognise the moral importance of being empowered as free and equal citizens of a genuinely democratic polity.* ❞

The reason Gutmann claims we should teach children "to recognise the moral importance of being empowered as free and equal citizens of a genuinely democratic polity" is that there is not a world polity. She believes a world polity could only exist in tyrannical form. For Gutmann, instead of tyranny, a truly democratic political regime is right for justice reasons, and therefore it does not need to be given priority in order to cultivate loyalty to a particular community.

As Appiah's and Gutmann's critics imply, global justice in the context of education are inevitably considered alongside states because, in actuality, a fair global system has not been affirmed, and ideal educational theory has to be constructed starting with that assumption. Here we can see that the types of thinking in political philosophy and in philosophy of education have some minor deviations from each other.

The Need for Deliberative Democratic Education

Why does Gutmann adhere to democracy? Gutmann (1996:69) indicates that:

> *A philosophy of democratic education rejects the idea that national boundaries are morally salient. If they are politically salient, however, then public education ought to cultivate in all students the skills and virtues of democratic citizenship, including the capacity to deliberate about the demands of justice for all individuals, not only for present-day citizens of the U.S. Deliberating about the demands of justice is a central virtue of democratic citizenship because it is primarily (not exclusively) through our empowerment as democratic citizens that we can further the cause of justice around the world.*

In **Democratic Education**, Gutmann claimed that the ideal educational goal is conscious social reproduction, and that education is limited by the principles of non-repression and non-discrimination (Gutmann 1999:44–45). The former principle "prevents the state, and any group within it, from using education to restrict rational deliberation of competing conceptions of the good life and the good society," and the latter "prevents the state, and all groups within it, from denying anyone an educational good on grounds irrelevant to the legitimate social purpose of that good."

Her theory of democratic education was complimented by the concept of deliberative democracy in 2000s. There are two reasons for extending her theory in this way. First, because preference-aggregated democracy runs the risk of not being just (e.g., majority members do not take the voices of those in the minority group seriously in their decision making) and, second, because there is a possibility that the participants will change their own beliefs through deliberation (Hirai, 2017).

Gutmann emphasise the second aspect as the principle of the economy of moral disagreement (Gutmann and Thompson, 2004:7), saying:

> *In giving reasons for their decisions, citizens and their representatives should try to find justifications that minimise their differences with their opponents. … Practicing the economy of moral disagreement promotes the value of mutual respect (which is at the core of deliberative democracy). By economising on their disagreements, citizens and their representatives can continue to work together to find common ground, if not on the policies that produced the disagreement, then on related policies about which they stand a greater chance of finding agreement.*

Such an assertion can be applied to the method of nurturing citizens who can pursue justice across national boundaries while recognising the nation-states. It is essential to develop the ability to relate the interests of others and think comprehensively while limiting their interests through deliberative or interactive education.

Conclusion: Towards a Fair Global World

UNESCO (2014:15) describes GCED as education that "aims to empower learners to engage and assume active roles, both locally and globally, to face and resolve global challenges, and ultimately to become proactive contributors to a more just, peaceful, tolerant, inclusive, secure, and sustainable world." UNESCO (2014:16) also indicates, in particular, that GCED aims to "encourage learners to analyse real-life issues critically and to identify possible solutions creatively and innovatively; support learners to revisit assumptions, world views, and power relations in mainstream discourses and consider people or groups that are systematically under-represented or marginalised; focus on engagement in individual and collective action to bring about desired changes; and involve multiple stakeholders, including those outside the learning environment, in the community and in wider society." These aims are appropriate to this global era as an ideal. However, it is more necessary to consider the related challenges that include, for example, "the question of how to simultaneously promote global solidarity and individual competitiveness" or the method of "the reconciliation of local and global identities and interests" (UNESCO 2016:19). Moreover, UNESCO (2015:65 and 81–82) indicates that the role of the state in the definition and formation of citizenship is increasingly challenged by the emergence of trans-national forms of citizenship (e.g., trans-national social and political communities, civil society, and activism) and that it is necessary to strengthen the role of intergovernmental agencies in the regulation of global common goods. In this article, I explore issues related to these challenges.

Educational goals have two general aspects—to develop the individual and to develop the social responsibility (sociality) within the individual. As long as education is governed by nation-states, its national contents inevitably take priority to those of the global world. But this educational thinking, counter-posed by political philosophy, must now be questioned and reconsidered. What should be emphasised in the global society is not to educate citizens who participate in the global society but primarily contribute to their own state, but to educate citizens who can relativise their state, sometimes be critical of it, and pursue global justice. To fully meet that end, the right disposition and the ability to overcome the desire to give priority to self-interests are necessary; this is consistent with the ideal pursued by deliberative democracy. As UNESCO (2014:21) indicates that transformative pedagogy leads to educative and social innovations that bring about change for the better, it is thought that deliberative democratic education has the same features as transformative pedagogy. In the motion towards a just global world, it is hoped that deliberative ideals are broadly accepted, and deliberation on controversial issues is adopted as a method used in GCED.

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Issues and Expectations in Japan About Moral or Values Education

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Abstract

This article tackles values education, which has a diverse range of meanings, depending on one's country, region, and person. In this article, however, it as a generic term that covers moral, religious, political, citizenship, character, and other kinds of education. In Japan, the law requires neutrality with regard to religion and political affiliation so values education is more often taken to mean moral education.

Introduction

Today, we live in a global society that requires us to respect a diverse range of value systems and coexist with different cultural groups. This necessitates major changes in the world of education, particularly moral education.

Compared with other countries, however, Japan has not seen any major change in the way moral education is taught. The Japanese government and MEXT, of course, have strong ambitions for reform. In fact, moral education reforms were made to the course of study for the first time in about 10 years last year. The most significant change has been the transformation of moral time, a learning area, into the subject morality. Despite this, however, almost no progress has been made in terms of classroom practice.

This article will identify problems in Japan, along with a future outlook that puts forth best approaches to values education not just in the country, but also in other Asian countries.

Changes to Moral Education in Japan

The modern school system in Japan was established by law in September 1872. Two months before that, the then-Ministry of Education, Science, and Culture established a normal school for teacher education as the country's first public school. That normal school is the forerunner of the University of Tsukuba. The school adopted European and American instructional methods and disseminated these throughout Japan.

Around 1879, however, apprehensions about the Westernisation of education in Japan arose, along with hopes of giving the Emperor a central role in the system. The movement asserted Chinese Confucianism. Before long, the movement gained power and in 1890 the "Imperial Rescript on Education" was announced as the Emperor's declaration regarding education:

> *Know ye, our subjects; our Imperial Ancestors have founded Our Empire on a basis broad and everlasting and have deeply and firmly implanted virtue; our subjects ever united in loyalty and filial piety have from generation to generation illustrated the beauty thereof. This is the glory of the fundamental character of Our Empire, and herein also lies the source of our education. Ye, our subjects, to be filial to your parents, affectionate to your brothers and sisters; as husbands and wives be harmonious, as friends true; bear yourselves in modesty and moderation; extend your benevolence to all; pursue learning and cultivate arts, and thereby develop intellectual faculties and perfect moral powers; furthermore advance public good and promote common interests; always respect the Constitution and observe the law; should emergency arise offer yourselves courageously to the State; and thus guard and maintain the prosperity of Our Imperial Throne coeval with heaven and earth. So shall ye not only be our good and faithful subjects, but render illustrious the best traditions of your forefathers.*
>
> *The Way here set forth is indeed the teaching bequeathed by Our Imperial Ancestors, to be observed alike by their descendants and the subjects, infallible for all ages and true in all places. It is our wish to lay it to heart in all reverence, in common with you, our subjects, that we may all thus attain to the same virtue.*
>
> *The 30th day of the 10th month of the 23rd year of Meiji, (Imperial Sign Manual, Imperial Seal)*

Note: Then-Minister of Education Nobuaki Makino asked Dairoku Kikuchi and others to prepare this English translation in 1906.

In the declaration, the ideal state of the citizenry or their values as human beings are clearly indicated based on a view of the state centered on the Emperor. This way of thinking was taken as guide for school education and gave the direction for moral education. Until the end of World War II, that direction was not just a matter of theory, but carried out in actual practice in schools. Government-designated textbooks on moral education were prepared in accordance with this policy and the moral values that needed to be imparted were taught through the characters in featured stories (i.e., values-oriented moral education). The moral values or virtues that were given special emphasis included loyalty, filial piety, friendship, mercy, devotion, reverence, courage, and modesty. At worst, this led to militaristic thinking. For example, the death of the soldier Kohei Kikuchi in the Sino-Japanese War of 1894–1895 was described in a government-designated textbook for first-grade students published in 1918 as: "Kohei Kikuchi was struck by an enemy bullet, but even in death the bugle never left his lips."

After Japan's defeat in World War II in 1945, American-style education oriented towards learning from life experiences had a strong impact. Moral education was provided through educational activities in school, primarily social studies classes. The government began to think more strongly that moral education based on such methods was inadequate. As such, in 1958, although the basic policy for providing instruction throughout the entire curriculum did not change, giving students moral time once a week in place of social studies in elementary and middle schools was introduced. At that time, moral time was a learning or schedule area and not a subject. Students learned about moral values such as honesty, friendship, moderation, kindness, gratitude, fairness, and diligence (values-oriented moral education) at this time.

Although the wording of the objectives of moral education has been revised and moral time has been turned into the subject morality, the approach to moral education has not changed for more than 50 years now. Various techniques were devised as instructional methods. In particular, American-style methods to teach moral education and psychology were incorporated into the subject. Techniques such as value clarification and moral discussion were used. Teachers no longer inculcated values in students but instead emphasised "self-determination" in an effort to be values-neutral. This method, however, had the disadvantage of falling into value relativism. The teachers no longer taught important values. And so additional instructional materials were written, which were strongly influenced by the psychological approach of turning moral problems into problems of individual psychology.

The most notable material was "Notebook of the Heart," a teaching aid for moral education for third- and fourth-grade students issued in 2002 by MEXT (psychology-oriented moral education). This teaching aid did not inculcate values in a top-down fashion; it was very crude. It had, for instance, a topic titled "Let's treat mistakes as valuable things." This was accompanied by a picture of a boy who destroyed an older man's flowerpot with a soccer ball and words such as "Mistakes can be valuable things for improving oneself in the future." It turned a problem that anyone can experience in daily life into a personal issue. It taught students to treat mistakes as valuable things but did not advise them to apologise, which could cause extreme distortions in their morality. If we break someone else's property, should we really prioritise thinking of the event as a valuable lesson? If that was the case, would we not make it a habit to commit mistakes so we learn more? Does this not cause people to be extremely egotistic?

The responses to the questions become clearer when the text was compared with the content of a prewar government-issued textbook for first-year students published in 1918, which taught students not to hide their mistakes. In one story, a boy apologised for damaging a shoji screen (paper sliding screen) on his neighbour's house while playing with a ball. It taught students to apologise for mistakes unlike in a similar story in "Notebook of the Heart." Too much emphasis on psychology-oriented morality then may not be the proper way to go. "Notebook of the Heart" was later revised and republished as "Our Morality." This new book added reading materials to the previous book.

A few years ago, a call within the government for a qualitative change in moral education was made to solve bullying problems amongst children. MEXT then reviewed how moral education was taught. In March 2017, a general revision to the course of study was made. Moral time was turned into the subject morality, which was not only values-oriented, but also psychology-oriented.

The Current State of Moral Education in Japan

Beginning April 2018, MEXT-certified textbooks were used in morality classes in elementary schools. The same will be used in middle schools starting April 2019. Handling morality classes integrating evaluation with instruction became an important issue. And so MEXT formed an expert council to determine how best to evaluate student performance in moral education. The council's report was issued in July 2016. The report included a concise and easy-to-understand description of current problems and future issues in moral education.

The report proposed to achieve qualitative changes in morality by removing biases towards simple discussions of the feelings of the characters in featured reading materials. Instead, teachers need to use a diverse range of instructional methods such as learning based on problem solving to tackle issues. They need to take a basic approach towards evaluation such as using the plan, do, check, and act (PDCA) cycle:

- Teachers need to provide written evaluations and not just grade students' work.

- Evaluation must be based on a broad range of categories.

- Teachers must perform intra-individual evaluations that encourage students.

- Evaluation must emphasise student development with regard to maintaining multi-faceted and multi-perspective viewpoints. Students must deepen their understanding of moral values in relation to their own selves.

- Teachers must observe and address specific learning needs of individual students over time.

The report also called for observation over a long period of time, for example, one year. It called for inspection of essays on thoughts and impressions formed over the course of a year. Students should be encouraged to apply their learnings in their daily lives. Teachers should evaluate students based on growth.

On-the-spot instruction should avoid understanding how story characters felt but should focus on self-involvement (putting themselves in the given situation). The report also discouraged discussions of simple life experiences. Teachers should instead incorporate experiential and problem-solving techniques in morality classes. Moral education should be founded on values-oriented moral education. Improving evaluation methods should be treated as an opportunity to promote diverse instructional methods through instruction integration.

Conclusion

Recent reforms in moral education in Japan did not start from the academe or the front lines of education, but rather from government leaders. Making morality a school subject was a result for public clamour to respond to bullying. As such, on 16 February 2013, the Education Rebuilding Implementation Council under the supervision of Prime Minister Abe, mandated schools to teach morality. The subject, however, lacked academic research support. It was nothing more than a replacement to the learning area, moral time. The classes still used similar textbooks such as "Notebook of the Heart." Instruction continued to focus on exploring the psychology of the main story characters. Students were still not asked to put themselves in the characters' shoes and engage in moral discussions and problem-solving activities. The country is thus still a long way off from the qualitative change that MEXT seeks. To make a radical change, moral education in Japan needs to improve.

Educational leaders need to shake themselves free from adhering to conventional values (rely on unquestionable beliefs they have been taught) and psychology-oriented learning (instead of solving problems in real life, they are satisfied to resolve issues as individuals).

Major results are unlikely to be achieved if we solely focus on reforming instructional methods related to moral behaviour. We can not only rely on experiential, problem-solving, and discussion-based learning, we need to do more. We should not only focus on what matter at present and improving content. We should integrate instruction and evaluation. We should keep in mind that in today's globalised society, we must know what morals are also taught in other countries and regions.

Unfortunately, Japan has been focusing more on improving instruction rather than actual content. Times have change and so should the content taught. Over the years, the list of values has just expanded to include autonomy, good faith, moderation, growth in individuality, courage, pursuit of truth, kindness, gratitude, courtesy, friendship, tolerance, respect for rules, fairness, diligence, familial love, group life, respect for tradition and culture, international understanding, respect for life, protecting nature, reverence, and joy in living. More than 80 concepts are taught from the first grade to middle school. Teachers cannot possibly remember them all. And moral education specialists involved in creating course outlines do not even attempt to prioritise what students should be taught more.

The "Imperial Rescript on Education" advocates 12 morals—be filial to your parents, help your siblings, be harmonious as husbands and wives, and so on. Not all people will be able to remember them. Even ancient Greece only advocated four virtues—courage, prudence, temperance, and justice. These are the same virtues taught in the medieval West, along with three additions—faith, charity, and hope. Buddhism teaches eight virtues in the "Noble Eightfold Path"—right view, right resolve, right speech, right action, right livelihood, right effort, right mindfulness, and right concentration. Islam has "five pillars"—faith, prayer, charity, fasting, and pilgrimage to Mecca.

Japan should consider the moral values taught in the global society as well. Students need to learn to respect diverse value systems and coexist with members of different cultural groups while valuing their own culture and traditions. The U.S. emphasises justice, human rights, and freedom. Perhaps, Japan should come up with a shorter list as well. An example would be respect for wa (harmony), abiding by the providence of nature, and feeling gratitude towards humanity and all things (captured in the word "arigato" or "thank you"). The Japanese people should pool their great wisdom and produce a list of at most 10 virtues that they consider particularly important. Doing that first is the most pressing issue for moral education. If fundamentally important content can be identified and appropriately taught in accordance with children's growth, perhaps moral education will show rapid progress. The current exclusive focus on improving instruction needs a fundamental change.

In addition, Japan can work with the ASEAN to come up with moral values and content that would suit all countries in an effort to crate shared or common values that transcend differences in culture, history, and religion. This could lead to the creation of an "ASEAN Values Education Charter" that can be implemented in schools, which can in turn lead to a peaceful society of symbiosis and coexistence. Unlike other regions, ASEAN has a diverse mix of religions and cultures. That is why the creation of a single set of universal values is important if Southeast Asia aims to be a conflict-free society. This hope can be achieved with improvements to values education.

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Seeking the Value of Mathematics Education: The Case of SEA-BES

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Abstract

The aim of this article is to share what values are described in the SEA-BES: CCRLS for Mathematics and Science (SEAMEO RECSAM, 2017) in relation to mathematics education. In the SEA-BES: CCRLS (2017) document, there are four meanings of values being discussed. The first one is the necessity of SEA-BES to provide the basis of specifying the style of descriptions, contents, and aims of SEA-BES. The second one is to describe the significance of mathematics, which provides the necessity of mathematics education. The third one elaborates the nature of mathematics which explains the framework for the objective of mathematics education. The fourth one explains the value of mathematics, which should be learned in mathematics classroom. This article explains those four meanings in SEA-BES: CCRLS and elaborates the fourth one for illustrating how students' values will be developed through the teaching and learning of mathematics in the classroom.

Introduction

The "SEAMEO Education Action Agenda (2016–2020)" puts forward seven priority areas to provide opportunities for the development of quality education to meet the needs of all ASEAN children. Agenda 7 — adopting a 21st-century curriculum — states to pursue a radical reform through systematic analysis of knowledge, skills, and values needed to effectively respond to changing global contexts, particularly to the ever-increasing complexity of the Southeast Asian economic, sociocultural, and political environment, developing teacher imbued with ASEAN ideals in building ASEAN community within 20 years (2015–2035). SEA-BES: CCRLS (2017) is the document developed for one of the projects in the action agenda #7 spearheaded by SEAMEO RECSAM. These issues concur the necessity for the development of a harmonious society in this competitive era. In these context, the SEA-BES the learning standards for mathematics and science are established under the following principles:

1. The standards are the common ground to develop the fullest potential and capabilities to acquire competency in the 21st century.

2. The standards are presumed for overcoming competitive society in this globalisation era and understanding others to create the ASEAN harmonious society under global citizenship.

3. The standards function as tools for analysing curriculum for the purpose of the project as stated in a to f:

   a. To be used as an analytical tool to support future development of a regional integrated curriculum necessary for ASEAN integration with emphasis on 21st-century skills

   b. To strengthen ASEAN collaboration on curriculum standards and learning assessment across different educational systems to respond effectively in the changing global context and complexity of ASEAN

   c. To promote in every member country the establishment of best practices to overcome differences in curriculum

   d. To produce systematic discussion process for the establishment of the regional integrated curriculum and assessment

   e. To be used as a platform for curriculum development and professional development for all stakeholders for developing teachers imbued with ASEAN ideals in building ASEAN community

   f. To serve as a platform for assessment such as the Southeast Asia Primary Learning Metrics (SEA-PLM)

The document developed consideration of the current status of the region as well as issues for curriculum reforms in the world. In keeping abreast with the global development, 21st-century skills has been emphasised in accordance to the term of competency defined by OECD (2005). The competency being defined encompasses the standards for successful living and maintenance for well-functioning societies. These goals are a continuously challenge to success and welfare in the economically competitive and dynamic society under globalisation. UNESCO (2015) sets the SDGs as the necessity for the development of every society and the sustainability of its social welfare.

Mathematics and science count as necessary forms of literacy in any field, including new unknown industries, which are expected by the STEM innovation, as well as general life well-being. Mathematics and science curriculum are tools for overcoming the challenges of diversities in Southeast Asia through developing competency for competitiveness and understanding others for creating a harmonious society. In these perspectives, the SEA-BES: CCRLS for Mathematics consider and describe three major components as for aims of education. First, for cultivating basic human characters through mathematical values, attitudes, and habits of mind. Second, for developing creative human capital where process skills are needed to be developed. Third, for cultivating well-qualified citizens through knowledge of mathematics. In the past mathematics education, third aim usually recognised as content of teaching by teachers. However first and second aims have been recognised in the several curriculum documents for mathematics more than several decades. For clarifying how these three components function within the mathematics framework, the nature of mathematics is initially discussed and to support how the aims of SEA-BES in mathematics are deduced. Subsequently, the format of the SEA-BES: CCRLS for Mathematics is described before the elaboration of every learning standard.

Excerpts of Descriptions for Values in SEA-BES: CCRLS for Mathematics

The following are excerpts for discussions of values to deduce the aims of mathematics education for SEA-BES: CCRLS for Mathematics.

Necessity to Learn Mathematics

Mathematics has been recognised as a necessary literacy for citizenship and not only for living economically, but also to establish a society with fluency of fruitful arguments and creations for better living. It has been taught as a basic language for all academic subjects using visual and logical-symbolic representations. Currently, mathematics also provides the necessary bases for STEM education. Beyond the limitation of STEM education, mathematics has been increasing its role for future prediction and designing with big data that produces innovation not only for technological product, but also for various business models. Mathematics is also an essential field of knowledge to establish common reasoning for sustainable development of society through viable argument in understanding each other and develop critical reasoning as the habits of mind.

Nature of Mathematics to Propose the
SEA-BES: CCRLS for Mathematics Framework

For clarifying the framework in SEA-BES: CCRLS for Mathematics and by knowing the role of mathematics education, the humanistic and philosophical natures of mathematics are confirmed as follows. Humanistic nature of mathematics is explained by the attitudes of competitiveness and understanding of others. This is illustrated by mathematicians such as Blaise Pascal, Rene Descartes, Isaac Newton, and Gottfried Wilhelm Leibniz. For example, if you read the letter from Pascal to Pierre de Fermat, you will recognise the competitive attitude of Blaise Pascal to Fermat's intelligence and seeking the way to understand his excellent finding on his (Pascal) Triangles. By reading Pascal's **The Pensées**, you would recognise how Pascal denied Descartes's geometry using algebra from the perspective of ancient Greece geometry. On the other hand, Descartes tried to overcome the difficulties of ancient geometry by algebra. If you read the letter from Descartes to Elizabeth, you would recognise how Descartes felt happy and appreciated the Royal Highness Elizabeth used his ideas of algebra in geometry. Despite being a princess, Elizabeth had been continuously learning mathematics in her life.

There were discussions on who developed calculus, whether it was Britain or Continent. On that context, Johann Bernoulli, a Continental mathematician, posed a question on the journal about the Brachistochrone problem, regarding locus of the point on circumference of the circle when it rotates on the line. No one replied and Bernoulli extended the deadline of the answer and asked Newton to reply. Newton answered it within a day. Finally, six contributions of the appropriate answer, including Newton and other Continental mathematicians, were accepted. All those stories show that mathematics embraces the humanistic nature of proficiency for competitiveness and to understand others in order to share ideas.

Philosophical nature of mathematics can be explained based on ontological and epistemological perspectives. On the ontological perspective, mathematics can be seen as a subject for universal understanding and common scientific language. The views of Plato and Aristotle are usually compared on this perspective. Plato believes that the existence of the world of "idea" and mathematics existed in the world of idea on Platonism. On this context, mathematical creation is usually explained by the word "discover," which means taking out the "cover" from which it has already existed. At the moment of discovery, reasonableness, harmony, and beautifulness of mathematical system is usually felt. Aristotle tried to explain about reaching idea from the material to the form. This explains that abstract mathematics can be understood with concrete materials using terms such as "modelling," "instruments," "embodiment," "metaphor," and "change representation." From both the ontological perspectives, mathematics can be understood and acquirable by everyone and, if acquired, it serves as a common scientific language which, is used to express in any subjects. Once the ideas are represented using the shared common language, it is possible that the world perceives the same view autonomously.

On the epistemological perspective, mathematics can be developed through processes, which are necessary to acquire mathematical values and ways of thinking. From this perspective, idealism and materialism are compared. On the context of Hegel, a member of German idealism, Imre Lakatos explained the development of mathematics through proof and refutation. On this context, mathematics is not fixed but an expandable system that can be restructured through a process of dialectic in constructing viable arguments. Plato also used dialectic for reaching ideas with the examples of mathematics. The origin of dialectic is known as the origin of indirect proof. In education today, dialectic is a part of critical thinking for creation. Parallel perspectives for mathematical developments are given by George Polya and Hans Freudenthal. For the discovery of mathematics, Polya explained mathematical problem solving processes with mathematical ideas and mathematical ways of thinking in general. Freudenthal enhanced the activity to reorganise mathematics by the term "mathematisation."

Genetic epistemologist Jean Piaget established his theory of operations based on various theories, including the discussion of Freudenthal, and explained the mathematical development of operations by the term "reflective abstraction." Reflection is also a necessary activity for mathematisation by Freudenthal. On materialism, under Vygotskyian perspective, intermediate tools such as language become the basis for reasoning in the mind. Under his theory, the high-quality mathematical thinking can be developed, depending on the high-quality communication in mathematics classrooms. A dialectical-critical discussion should be enhanced in the mathematics class. From both the epistemological perspectives, mathematics can be developed through the processes of communication, problem solving, and mathematisation, which include reorganisation of mathematics. Those processes are necessary to acquire mathematical values and ways of thinking through reflection.

Aims of Mathematics Education in SEA-BES: CCRLS

The aims of mathematics in SEA-BES: CCRLS for developing basic human characters, creative human capital, and well-qualified citizens in Southeast Asia for a harmonious society are as follows:

- Develop mathematical values, attitudes, and habits of mind for human character

- Develop mathematical thinking and able to engage in appropriate processes

- Acquire proficiency in mathematics contents and apply mathematics in appropriate situations

Framework for SEA-BES: CCRLS for Mathematics as shown in Figure 6 is developed based on the three components with discussions of the humanistic and philosophical nature of mathematics. This framework also depicts the concrete ideas of mathematics learning of the above aims.
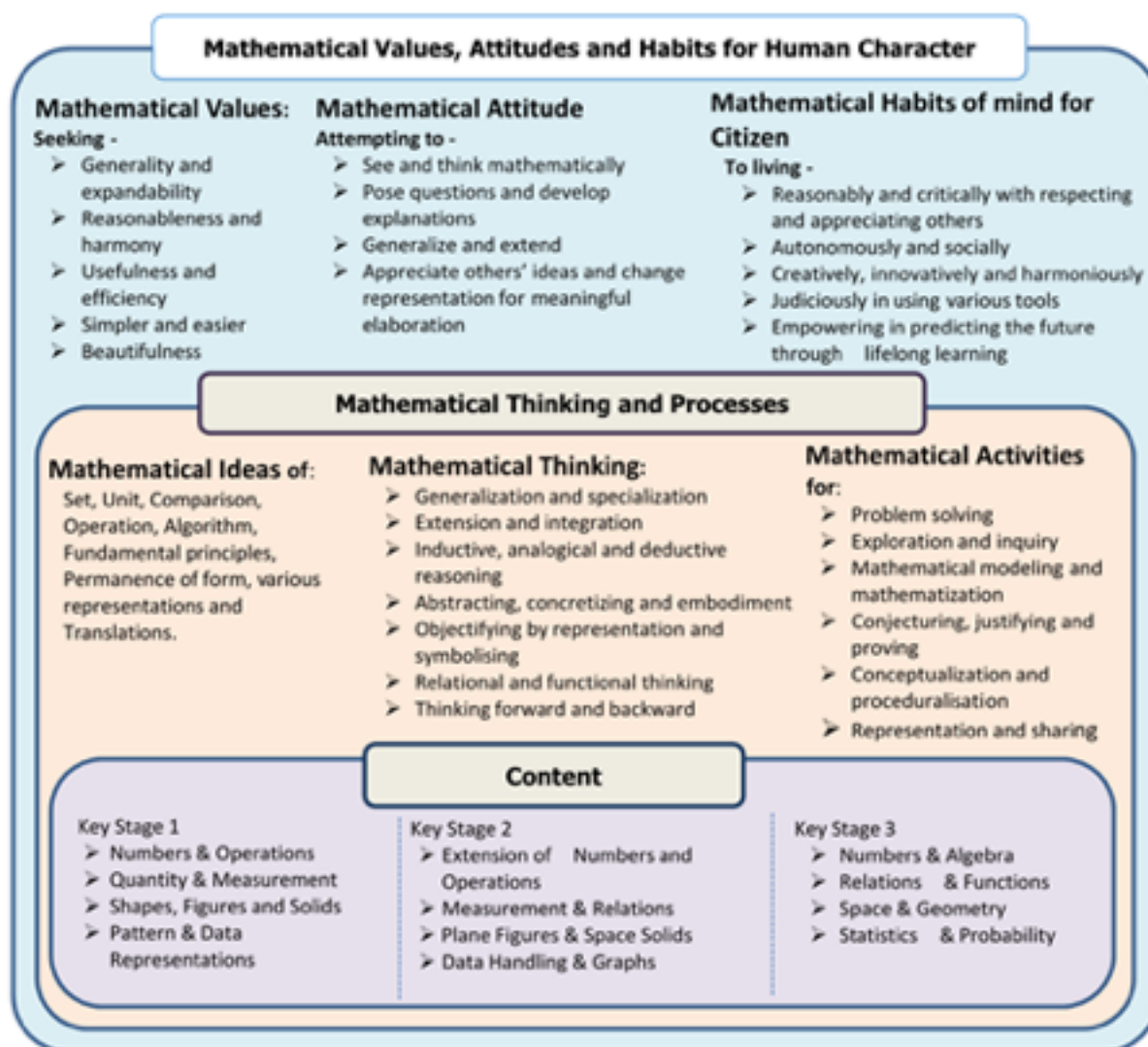
Figure 6: SEA-BES: CCRLS framework for mathematics education

At every given context on the curriculum, those three components are mutually related and explains various objectives for education. Those components under this framework are functioning to interpret the objective of every learning standard in the SEA-BES: CCRLS.

Mathematical Values, Attitudes, and Habits of the Mind

For cultivating basic human characters, values, attitudes, and habits of mind are essentials to be developed through mathematics. Values are the basis for setting objectives and making decisions for future directions. Attitudes are mind-sets for attempting to pursue undertakings. Habits of mind are necessary for soft skills that contribute to living harmoniously in the society.

Mathematical values, mathematical attitudes, and mathematical habits of mind are simultaneously developed and inculcated through the learning of the content. Essential examples of values, attitudes, and habits of mind are given in Figure 6. On seeking values in mathematics, characteristics such as generalisable and expandable ideas are usually recognised as strong ideas. In explaining why such a particular proving is necessary in mathematics is usually related to seeking for reasonableness. Harmony and beautifulness can also be thought as mathematical values that are not only described in relation to mathematical arts, but also in the science of patterns and mathematical systems. Usefulness and simplicity are used in selection of mathematical ideas and procedures.

SEA-BES: CCRLS is written by four content strands and one process-humanity strand and in every strand, standards are described by using verb and adjective to embed the process and value into content of teaching.

Teaching of Thinking, Process, Value, and Attitude in Mathematics Classroom

In traditional manner of teaching mathematics, drills and exercises are used for teaching the contents. However the ways to teach thinking, processes, values, and attitudes in mathematics are not clearly stated like the teaching of mathematics content. SEA-BES: CCRLS (2017) illustrates that mathematical thinking, process, value, and attitude can be learned by students when teachers provide appropriate contexts in relation to specific content of teaching. Isoda (2012) illustrated that appropriate contexts are given by the task sequence in curriculum and student learning are usually distinguished by the terminologies such as acquisition of contents, reflection of processes, and appreciation of values.
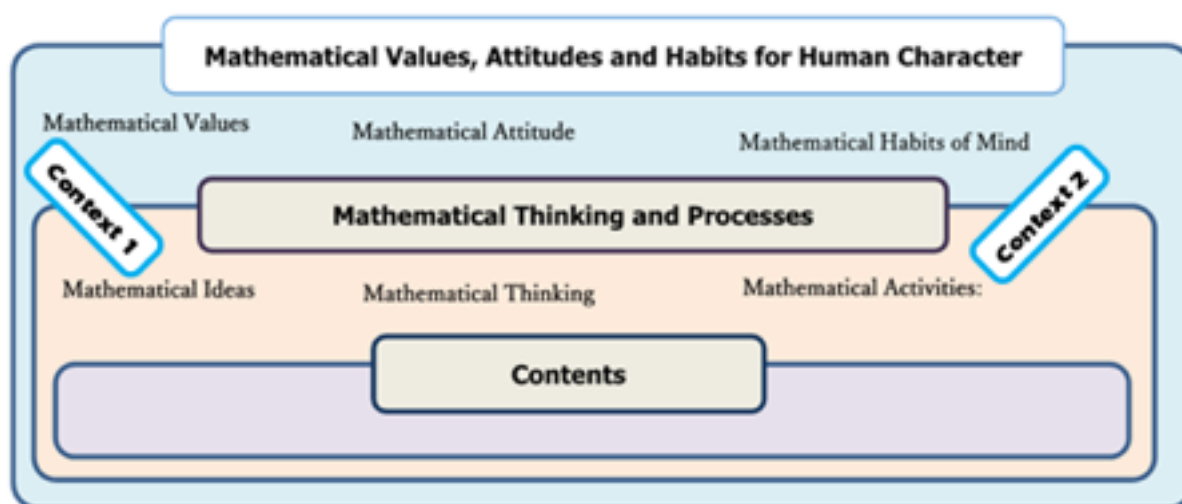

Figure 7: Learning mathematics in the appropriate context

How to Develop Thinking, Skills, Values, and Attitudes in Classrooms

Isoda (2012 and 2016) illustrated the task sequence from task 1 (37 x 3) to task 2 (15,873 x 7) for explaining how to develop mathematical thinking on Figure 6 framework (see the lecture video series by SEAMEO QITEM (https://www.youtube.com/watch?v= oCp2HijnVSk).
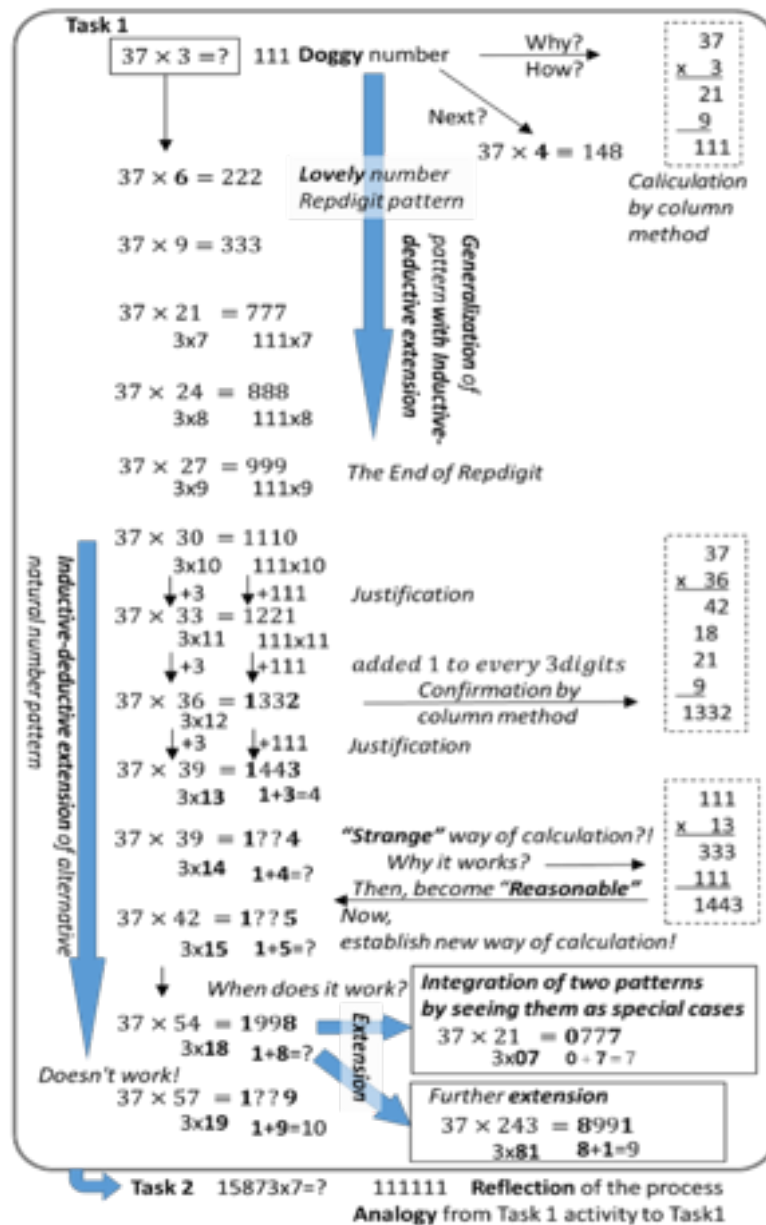

Figure 21: Illustration from task 1 to task 2
Source: M. Isoda and S. Katagiri (2016)

It begins from 37 x 3 = 111 (here, it is called "tentatively doggy number" because of Japanese sounds for barking) and through only questioning, "What do you want to do next?," the activity continues by learners' replies to this simple open question. If learners recognised 37 x 6 = 222, which is referred as "love numbers" (Japanese sounds for kissing to kids), then it is assumed that learners are able to find repeated digit patterns; firstly, finding the alternative natural number pattern, secondly, integrating different patterns and finally as one pattern. In the process, learners also find the conditions when every pattern can work and write the propositions by if-then format. These are the outcomes of mathematics and can be categorised as "content" in Figure 6.

Acquisitions of these content are enhanced by the exercise in task 2 as 15,873 x 7. The sequence from task 1 to task 2 is an application of learning. Although, the activity in task 1 is led by the teacher, students are able to challenge task 2 as long as the students could follow the explanation in task 1, which is written in the box of Figure 8. Content knowledge can be acquired by doing exercises. However, thinking, processes, values, and attitudes are difficult to be learned if teachers do not provide enough time for students to think by themselves on task 1.

In the activity elaborated above, the teacher only gave the question, "What do you want to do next?," subsequently providing the time to think and communicate and listening to students' ideas and any answers for that open question. Students are able to think whatever they can imagine, set their directions and representation for thinking, finding and sharing every pattern by themselves. Their reasoning can be expressed by the terminologies in Figure 6 such as "set" on mathematical ideas, "inductive, deductive and analogical thinking," "extension and integration," and "generalisation and specialisation" on mathematical thinking; "generality and expandability," "reasonableness and harmony," and "beautifulness" on mathematical values; and "pose question and develop explanation" and "change representation for meaningful explanation" on mathematical attitude. In the process of task 1, the question, "What do you want to do next?," is used to direct the thinking and reasoning of students whom, by themselves, would not be aware of using these terminologies on Figure 6 in the process. However, at the moment when they find 111,111 in task 2, they are able to reflect on and appreciate the whole process in the box of Figure 8 and recognise the various activities, efforts, and challenges done during the process of task 1 as the set of sequential activity for task 2. At the moment, if students felt that task 1 and task 2 might be the same activity, it meant that they are able to reflect and appreciate the process of task 1. At this juncture, the task sequence from task 1 to task 2 can be seen as a context on Figure 7 and the teacher is able to teach various terminologies in Figure 6 on this context.

Japanese textbooks well-embedded these type of task sequences for Figure 6 under Japanese curriculum on the name of "problem-solving approach." Some of SEAMEO countries already published in their editions or in process (Maitree and Isoda, 2010).

Conclusion

The SEA-BES: CCRLS for Mathematics curriculum has been developed based on the fundamentals of the nature of mathematics. With that concrete grounding, the values of mathematics prevail in the framework. This would ultimately enable the attainment of the aims of SEA-BES: CCRLS, particularly in promoting mathematical thinking and values in teaching and learning of mathematics in the classroom. The reference for SEA-BES: CCRLS itself was written in Managao, Ahmad, and Isoda (2017). The development process of SEA-BES: CCRLS was written in Montecillo, Teh, and Isoda (2018), which illustrated the curriculum development process as the elaborative and dialectic process of educational values.

Note: Authors of this article would like to deeply acknowledge all specialists and contributors in SEAMEO countries for their drafting and editorial works for SEA-BES: CCRLS. Especially, we would like to deeply acknowledge the contribution of Dr. Mohd Sazali bin Hj Khalid for the early stage of the drafting who passed away after his retirement of SEAMEO RECSAM.

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Values Education and Global Citizenship in Social Studies in Japan

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Abstract

Values education means education for the purpose of the teaching and learning of values used for decision guidelines and decision-making standards. It is desirable to distinguish values education from moral education that has been treasured in Japanese school education. Moral education deal with virtue, on the other hand, values education deal with values. In values education, students think about problematic and controversial problems that exist in modern society from a certain value criterion and collaboratively consider the solutions. Through this process, students acquire global citizenship. In addition, it is a subject of social studies that is set for purpose to play a core role in elementary and junior-high school. For example, in elementary-school social studies, students think about renovation of a river. Depending on which of the two values of conservation and protection is important, the ways of renovation, which students think are difference. Also, in junior-high school social studies, students think about the support of Niger in Africa. Amongst numerous solutions, considering the concept of "potential ability" by Amartya Sen, students consider which solutions should be given priority. The solutions differ for each student. Such efforts related to values education are variously practiced in today's school education in Japan. Practice of value education aiming at nurturing the global citizenship in Japan must be greatly developed utilising several efforts related to SDGs and characteristics of Japanese school education.

Introduction

Values, Education, and Development of Global Citizenship in Japan

School education in Japan places a strong focus on Moral Education. This is clear from the fact that this is a special subject in elementary and middle schools. Moral education in schools is conducted through all educational activities. That is to say, moral education takes place through learning in such subjects and courses as Japanese, social studies, and special activities. In social studies, for example, students learn that everyone needs to cooperate to get rid of trash. Also, one of the goals of special activities is to develop the awareness that one is a member of a group through cleaning as a team. In Japan, it is thought that morals are essential for people to live in society, and that these can be developed through school education.

However, such moral education in Japan differs from the general concept of values education. Values education means education for the purpose of teaching and learning of values used for decision guidelines and decision-making standards. Here, I would like to consider separately the virtues in moral education and the values in values education. Some who promote moral education think that virtues can be taught. It is, however, extremely difficult to teach the values in values education. In values education classes, students are required to think autonomously with certain values for decision criteria while engaged in cooperative discussions with other students. This type of education aims to develop intellectual autonomy.

In modern society, there are many problems that are difficult to resolve. Issues concerning such matters as poverty, peace, energy, and inequality, which are the focus of the SDGs, need urgent resolution to build a sustainable society. Values education in Japan uses these issues as teaching material and requires students to consider measures to resolve them. In particular, social studies aims to develop global citizenship in discussion-focused classes.

Based on the above and with having a goal to understand of Japanese values education, this article addresses social studies classes related to values education to make clear of the principles behind development of global citizenship.

Positioning of Social Studies in the Curriculum

Japan has a national curriculum called the "Course of Study." Both public and private schools develop curricula based on this. In actuality, these vary by school since they are developed in accordance with student and local conditions. Even in such cases, however, educational goals and content as well as number of hours for subjects in the Course of Study are not strictly observed.

In Japan, the Course of Study is revised once nearly every 10 years. The most recent revision took place in 2017 of elementary and middle schools and in 2018 for high schools. Based on this revision, new curricula will start from 2020 in elementary schools, 2021 in middle schools and 2022 in high schools. Here, I will focus on an explanation of elementary and middle schools since the new Course of Study for high schools will be presented in March 2018.

In the new Course of Study, elementary schools, for example, will have 11 subjects (Japanese, social studies, mathematics, science, living environment studies, music, drawing and crafts, HE, PE, foreign language, and moral education) and three extra subjects or activities (foreign language activities, integrated studies, and special activities). Middle schools will have 10 subjects (Japanese, social studies, mathematics, science, music, art, physical and health education, technical course and HE, foreign language, and moral education) and two extra subjects or activities (integrated studies and special activities). All of these are required courses.

Educational goals, content, and number of hours are stipulated in detail for each of these courses. The number of hours for social studies in elementary school, for example, is as follows: 70 for the third year, 90 for the fourth year, 100 for the fifth year, and 105 hours for the sixth year. In middle school, the number of hours for the same course is 105 for the first and second years and 140 hours for the third year. The amount of time for one credit is 45 minutes in elementary school and 50 minutes in middle school.

The goals of social studies in elementary and middle schools are mostly the same. In middle school, the goal is "to develop as follows a foundation for the disposition and abilities required for a citizen to form a peaceful and democratic nation and society existing independently in a globalising international society from a broad perspective through activities to inquire into and resolve issues using social views and thinking." The difference between elementary- and middle-school goals is that the "broad perspective" for middle school is not used for elementary schools. Behind this difference is that middle-school social studies consists of geography, history, and civics and therefore has more advanced course material than elementary school. In addition to the above, both levels of school have three concrete goals. These three goals concern the areas of knowledge and skills, the abilities of thinking, judgement, and expression as well as the motivation to learn and humanity. The viewpoint of these three goals is shared across all courses.

From the social studies goals, we can understand that the disposition and ability that this course aims for is global citizenship. Also, since the goal concerning the abilities of thinking, judgement, and expression touches upon the ability to understand social issues and choose and decide how to become involved in society to resolve them and the goal concerning the motivation to learn and humanity covers the attitude to conceive of a better society and independently solve problems, we see that social studies plays an important role in promoting values education in schools.

Classes Concerning Values Education in Social Studies

Principle of Developing Global Citizenship Based on Values Education

The term "values education" is not frequently used in social studies in Japan. Accordingly, classes introduced here are those thought to be connected to such education. Classes selected meet the below three requirements.

The first is that they use social issues as teaching material. Even in a social studies class that aims to develop global citizenship, social issues addressed do not need to be global in nature. Important social issues that are difficult to resolve, whether they be foreign or domestic, are raised. The second is students thinking autonomously while referencing values standards. Social issues are difficult to resolve because multiple values are in opposition regarding the issue. Values-education-based social studies classes compel students to confront this conflict and make autonomous decisions using what they have learned as well as their own life experience. The third requirement is valuing class discussions. In recent years, many have pointed out the importance of active learning in schools in Japan. In our globalised society, there is a need to cooperatively consider and implement resolutions to problems. Social studies continuously works to link classroom learning with learning in society.

With the above, I propose the below three points as principles in developing values-education-based global citizenship:

- **Development Principle 1:** Using social issues as teaching materials.

- **Development Principle 2:** Autonomous student thinking based on decision-making standards.

- **Development Principle 3:** Emphasis on discussion as cooperative class learning.

Now, I will introduce elementary- and middle-school social studies classes that meet these three principles.

Social Studies Classroom Practices in Elementary Schools

Here, I will discuss learning in social studies classes for fifth-graders in elementary school.

Social studies for the fifth grade in elementary school addresses the five areas of (1) the territory of Japan and the lives of its people; (2) agricultural and fishery food production in Japan; (3) Japanese industrial production; (4) the relation between industry and information in Japan; and (5) the relation between the country's natural environment and the lives of its people. Of these, study concerning item 5—the environment—is further divided into the three areas of natural disasters, forests, and pollution.

Upon the conclusion of the unit on natural disasters, students who learned such matters as types of these disasters, the locations and timing of their occurrence, as well as disaster measures on the national and prefectural level considered issues faced by their own region. These issues concern how to improve rivers, which cause great damage to the region through repeated flooding.

Two different positions concerning river improvement are presented to the students—conservation and preservation.

The conservation position is based on the idea of "protection of nature for humans" and students are presented with the following view of a conservation advocate.

> **"** *The river that flows through our town floods nearly every 10 years. You probably still remember the flood last year that killed many people and destroyed homes. We propose covering the riverbed with concrete to prevent flooding. Even if we do this, the fish in the river will remain there. Also, we will build a water park around the river so that the river will be popular amongst town residents* **"**

On the other hand, the preservation position is based on the idea of "protection of nature for nature." The following view of a preservation advocate was presented to students.

> **"** *The floods are so damaging because our natural disaster preparedness is lacking. Even if we are sufficiently prepared though, we cannot completely avoid damage. Floods are unavoidable. If we cover the riverbed with concrete, it will have a great impact on the surrounding environment. The fish and the beautiful nearby vegetation that are there now will be gone. Protecting nature is more important than anything else.* **"**

To start, students summarise the pluses and minuses of each position in a table to accurately understand them. They then choose a position and discuss with students who selected the other position. The discussion, however, is not to seek an answer. The point is to clarify the decision criteria for conservation and preservation for students to have a basis for sharing their views with others and to work together to derive solutions. Considering problems without answers allows us to find the meaning of classroom practice based on values education.

Social Studies Classroom Practices in Middle Schools

Here, we will examine the study of international support in the civic area in middle school social studies classes.

This takes place in the third and final year of middle school. Classes consist of the following four areas: (1) contemporary society and us; (2) the economy and us; (3) politics and us; and (4) problems in international society and us.

In item 4 problems in international society and us, students who studied the role of international organisations, including the UN, the role of Japan in international society as well as Japanese security, self-defense, and international contributions come to see economic and technical cooperation as crucial in resolving problems such as the global environment, resources, and energy issues. These issues are the same as those addressed by the SDGs.

In their study of international support, students considered support for the Republic of Niger in Africa. On the southern edge of the Sahara Desert in West Africa, the Republic of Niger is one of the world's poorest countries due to repeated military coup d'états and a harsh natural environment. It is always at the bottom of the Human Development Index. Since it has the world's third-largest proven reserves of uranium, a key mining commodity, this country has deep trade ties with Japan. But these links have become tenuous with nuclear power plants in Japan suspending operations due to the explosion of the Number 2 Reactor at Fukushima in the Great East Japan Earthquake. The Republic of Niger is now a forgotten country.

Class teaching materials were prepared with the cooperation of Comment Niger, a Japanese non-profit organisation (NPO) that supports this country. To start, the following five current international support projects were presented to students—food donations, vaccinations against infectious diseases, provision of agricultural technology, construction of elementary schools, and donation of solar lanterns and the students considered which projects to prioritise. Then, international support conditions and the Amartya Sen capability approach was explained to the class, and the students again considered which of the five projects should receive priority.

In the first round, most students gave first priority to either food donations or vaccinations because they felt that human life was of the greatest importance. In the second round of decision making, the number of students assigning first priority to provision of agricultural technology or construction of elementary schools increased. This is a result of sustainability being added to human life as decision criteria for the students. Students considered not temporary support, but support of a long-term nature, and began to think about what kind of assistance would increase the potential of the people of the Republic of Niger.

Conclusion

In values-education-based classes, students are made to understand the conflict of values behind the resolution of problems and are reminded of their own important values through discussion.

Progress in Values Education and Development of Global Citizenship

In Japan, there is increasing consideration of developing global citizenship and with the adoption of the "2030 Agenda for Sustainable Development" at the 2015 UN Summit resulting in the SDGs becoming widely known globally, there is increasing focus on such development.

The national government as well is working to support realisation of the SDGs by structuring an implementation system and guidelines and cooperating with stakeholders, and its role is likely to increase in importance. School-based education also plays an important role in developing global citizenship, and such a foundation will serve these children when they become adults and leaders of society.

Since Japan has a Course of Study as a national curriculum, it is possible to efficiently develop global citizenship and promote values education. Also, 20,000 elementary schools, 10,000 middle schools, 5,000 high schools, and 1,000 special support schools are capable of developing their own curricula based on the Course of Study through emphasis on the principles of curricula open to society and curriculum management. It is also now known globally that individual teachers can enhance class lessons through repeated lesson study. School education in Japan has a great deal of potential.

The values education classroom practice in elementary and middle schools examined here, however, is not necessarily the norm. The adverse effects of the teaching for exams that is common in East Asian nations and the reduction in opportunities for lesson study due to teachers being busy are obstacles to conducting values education classes. Also, the greatest issue is that the theory and methods for this type of education are under development. It is my hope that the three development principles covered here will contribute to such development.

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SDG 4.7:
Fostering Global Citizenship

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Abstract

Education for all (EFA) is an essential prerequisite of sustainable development. In addition to literacy and numeracy, education for today and tomorrow should equip learners with higher-order thinking skills (HOTS) such as critical-thinking and social and emotional skills to engage constructively with the uncertain and rapidly changing world. It is not sufficient for education to merely adapt to changing societal needs. It needs to be transformative. Values-based and action-oriented education, including education for sustainable development (ESD), GCED, and other related areas, are now encapsulated in SDG 4.7. This article discusses how SDG 4.7 is critical in achieving not only SDG 4 on education, but also achieving the other 16 SDGs.

Introduction

The interconnected environmental, economic, social, and political challenges facing humanity call for education that cultivates a sense of belonging to common humanity and responsibility to take action to address these challenges. The "2030 Agenda for Sustainable Development" is an intergovernmental commitment and "a plan of action for people, planet, and prosperity" comprising 17 SDGs (UN, 2015). Education is articulated as a stand-alone goal (SDG 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all) with seven outcome targets and three means of implementation (see Tables 7 and 8).

Table 12: SDG 4 Targets	
Target	**Detail**
4.1	By 2030, ensure that all girls and boys complete free, equitable, and quality primary and secondary education leading to relevant and effective learning outcomes.
4.2	By 2030, ensure that all girls and boys have access to quality early childhood development care and pre-primary education so that they are ready for primary education.
4.3	By 2030, ensure equal access for all women and men to affordable and quality technical, vocational, and tertiary education, including university.

Table 12: SDG 4 Targets	
Target	**Detail**
4.4	By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs, and entrepreneurship.
4.5	By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities (PWDs), indigenous peoples, and children in vulnerable situations.
4.6	By 2030, ensure that all youth and a substantial proportion of adults, both men and women, achieve literacy and numeracy.
4.7	By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, amongst others, through ESD and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship, and appreciation of cultural diversity and of culture's contribution to sustainable development.

Table 13: SDG 4 Implementation Means	
Implementation Means	**Detail**
4.A	Build and upgrade educational facilities that are child-, disability-, and gender-sensitive and provide safe, non-violent, inclusive, and effective learning environments for all.
4.B	By 2020, substantially expand globally the number of scholarships available to developing countries, in particular least-developed countries, small island developing states, and African countries, for enrollment in higher education, including vocational training and information and communication technology (ICT), technical, engineering, and scientific programmes, in developed countries and other developing countries.
4.C	By 2030, substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially least-developed countries and small island developing states.

EFA: A Prerequisite to Sustainable Development

The principles underlying SDG 4 are deeply rooted in the intrinsic—as opposed to instrumental—value of education and a humanistic vision of education, which UNESCO has championed since its inception. First of all, education is a fundamental human right. The state bears a duty to ensure universal access to inclusive and equitable quality education. Secondly, education is a public good and a shared societal endeavour (UNESCO, 2015). Not only the governments, but also civil society, teachers and educators, the private sector, communities, families, youth, and children all have important roles in realising the right to quality education.

EFA is an essential prerequisite for sustainable development. On one hand, SDG 4 is about continuing with the unfinished business of EFA. Targets 4.1 through 4.6 focus largely on expanding access to education and equipping learners with skills for employability. On the other hand, while these are no doubt important goals, they do not raise critical questions regarding the fundamental purposes of education. In other words, they aim at enabling learners to adapt to and succeed in society as it exists today—rather than "transforming our world" as being called for by the "2030 Agenda for Sustainable Development" (UN, 2015).

SDG 4.7: Education for Sustainable Development and Global Citizenship

In addition to literacy and numeracy, education for today and tomorrow should equip learners with HOTS (such as critical-thinking skills) and social and emotional skills to engage constructively with the uncertain and rapidly changing world. It is not sufficient if education is merely adaptive to the changing societal needs; education needs to be transformative (UNESCO, 2015). Values-based and action-oriented education—including ESD, GCED, peace and human rights education, environmental education, development education, global learning, inter-cultural education, EIU, and others—is now encapsulated in SDG 4 Target 7 (SDG 4.7).

Promoting peace and sustainable development through education is one of UNESCO's core missions and is now enshrined in SDG 4.7 as one of the goals, which nations around the globe aspire to achieve. There is a need to ensure education systems help build peaceful and sustainable societies. This includes ensuring that education systems help develop knowledge and skills necessary to foster mutual understanding, respect, and care amongst all people and for the planet we share and to engage responsibly and creatively with the changing world. This is critical not only to achieve SDG 4.7, but also to support the implementation of all 17 SDGs. Education in the "2030 Agenda for Sustainable Development" (UN, 2015) is not restricted to SDG 4. Education is specifically mentioned in targets of the five goals listed below, but also linked to virtually all of the other SDGs in one way or another:

- **Target 3.7: Health and well-being:** By 2030, ensure universal access to sexual and reproductive healthcare services, including for family planning, information and education, and the integration of reproductive health in national strategies and programmes.

- **Target 5.6: Gender equality:** The number of countries with laws and regulations that guarantee women aged 15–49 have access to sexual and reproductive healthcare, information, and education.

- **Target 8.6: Decent work and economic growth:** By 2020, substantially reduce the proportion of youth not in employment, education, or training.

- **Target 12.8: Responsible consumption and production:** By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.

- **Target 13.3: Climate change mitigation:** Improve education, awareness raising, and human and institutional capacity on climate change mitigation, adaptation, impact reduction, and early warning.

Conclusion

Ways Forward

Awareness and knowledge about sustainable development is not sufficient to foster competencies required for shaping more peaceful and sustainable societies. There is an increasing consensus on the critical importance of social and emotional skills (sometimes referred to as "soft skills"), in addition to "cognitive" skills (including both the foundational skills of literacy and numeracy and HOTS such as critical thinking). Today's education for the uncertain future should cultivate intelligence that integrates reason and emotion.

It is vital to give a central place to strengthening education's contribution to the fulfillment of human rights, peace, and responsible citizenship from local to global levels. One of the pathways to foster the knowledge, skills, values, and attitudes required by citizens to lead productive lives, make informed decisions, and assume active roles locally and globally in facing and resolving global challenges is to integrate the principles and values of sustainable development at the heart of the curriculum of core subjects, rather than inserting new thematic content into the already-overburdened curriculum (UNESCO MGIEP, 2017a and 2017b).

MGIEP is an integral part of UNESCO and its specialist institute on education for peace, sustainable development, and global citizenship. It calls for a fundamental rethinking of schooling (UNESCO MGIEP, 2017a) and proposes a strategy to integrate SDG 4.7 in core subjects such as mathematics, science, and languages to reorient education towards sustainability (UNESCO MGIEP, 2017b). While often treated as mere add-ons to gear schools for the 21st century, the notions of "sustainable development" and "global citizenship" fundamentally challenge the dominant discourses and practices of education today. To achieve the SDGs, we would need a culture of collaboration, care, and peaceful coexistence, not that of competition and pursuing individual and nationalistic gains. SDG 4.7 is about learning to live together on a planet under pressure—the planet we all share. To this end, policy-makers are encouraged to start embracing education not primarily as a tool for allowing people to participate in the global economy, but as a holistic experience of positive personal and cultural transformation.

Disclaimer: The ideas and opinions expressed in this article are those of the author; they are not necessarily those of UNESCO or UNESCO MGIEP and do not commit the organisation.

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Values Education and Global Citizenship Towards Achieving the SDGs and Promoting Humanities

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Abstract

This article presents a higher education capacity-building project funded by the Erasmus+ Programme of the EU, Indoped. The featured 2016–2018 project aims to modernise higher education in Indonesia via the adaptation of tried-and-tested European pedagogical approaches. These approaches put students at the centre of learning by primarily using multi-disciplinary techniques to prepare them for future professional challenges. By introducing and sharing different learning methods used by European university partners, we hope to add value to existing Indonesian pedagogical approaches to bridge the gap between what is taught in universities and what is required by industries. The pedagogical practices have been successfully piloted in SEAMEO university partners in Indonesia and had a positive impact on both students' and teachers' innovation competencies.

Introduction

The EU implemented the "Europe 2020 Strategy" to face new challenges and promote future growth towards becoming a sustainable social market economy (European Commission, n.d.). This strategy has led to the creation of the "Innovation Union," which mutually reinforced research, development, and innovation (RDI) to improve the region's competitiveness, create jobs, enhance its HR's employability, reduce poverty, and support effective energy use. To ensure that innovative ideas turn into products and/or services of future professionals, a new generation of workers that can use and transform their existing knowledge and skills into innovative products and/or services is needed. Higher education institutions (HEIs) that produce the said professionals thus have an important role to play in developing the innovativeness of their students.

An example of such effort was the establishment of the Turku University of Applied Sciences (TUAS) 10 years ago, with which Finland introduced the innovation pedagogy as a learning approach that enhances students' innovativeness. The innovation pedagogy is a new pedagogical approach that relies on assimilation, production, and knowledge utilisation to produce innovative products and/or services. The lecturers' and businesses' active use of the innovation pedagogy hopes to enhance the students' innovativeness in relation to their chosen field of study. The innovation pedagogy is characterised by active learning and teaching methods, work-life orientation, RDI integration and application in one's chosen field of study and professional activities, flexible curricula, multi-disciplinary approaches, internationalisation, entrepreneurship, versatility, and development-oriented assessment (Kairisto-Mertanen, Räsänen, Lehtonen, and Lappalainen, 2012).

Innovation competence refers to the ability to integrate knowledge, skills, and attitudes as a learning outcome of the innovation pedagogy. The "Framework for Innovation Competencies Development and Assessment" (FINCODA) Project, an EU-financed initiative, introduced a model of innovation competence. The model has three categories and five dimensions of innovation competence. The five dimensions—critical thinking, creativity, initiative, teamwork, and networking—are grouped into three categories—individual, interpersonal, and networking competence (Marin-Garcia, et al., 2016). Critical thinking is the ability to analyse, evaluate, estimate, or even foresee the outcomes of certain issues. Creativity, meanwhile, is the ability to think beyond boundaries and generate varied alternatives to ideas, designs, products, or services. Initiative, on the other hand, is the ability to make decisions and/or carry out actions for the further implementation of ideas, which can result in the development of an individual's innovation competence. To optimise organisational performance, individuals cannot stand alone, they need to effectively work with a group (teamwork) and external stakeholders (networking).
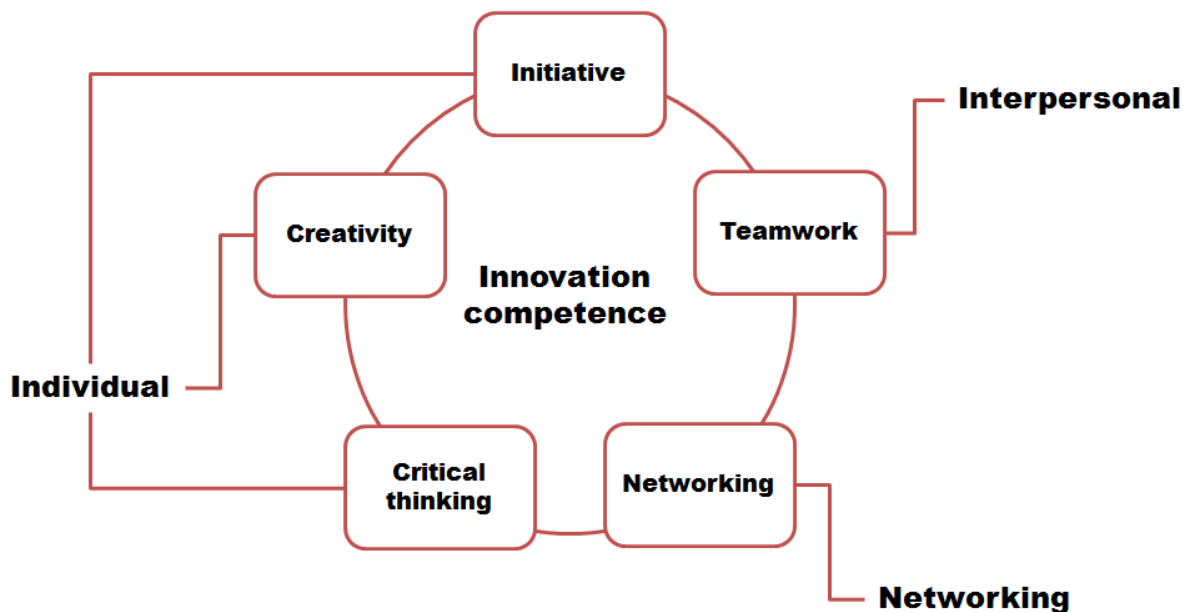

Figure 9: FINCODA innovation competence dimensions
Source: https://www.fincoda.eu/fincoda-blog/2017/10/16/the-fincoda-barometer-tool-explained

With an area of more than 1.9 million square kilometres comprising approximately 17,000 islands, Indonesia is the largest country in Southeast Asia and the largest archipelagic country in the world. Indonesia is the fourth most-populous country as well with more than 250 million inhabitants. As an archipelago, Indonesia has various ethnic groups who speak over 250 different languages and/or dialects. This geographical condition is reflected in the country's motto—"Unity in Diversity." Despite a population of more than 200 million Muslims, Indonesia is also home to Catholics, Protestants, Hindus, Buddhists, and Confucianists.

Tertiary education in Indonesia is characterised by a growing government budget allocation, institutional development, and increasing enrollment rate. The country's gross enrollment rate is, in fact, expected to grow from 21.3% in 2008–2009 to 30% in 2014 (OECD, 2010). Even though the rate remains lower than those of Malaysia, Thailand, and Singapore, Indonesia will continue to enhance the competitiveness of its professionals to support workforce mobility in Southeast Asia. Indonesian HEIs come in six forms—universities, institutes, colleges, polytechnics, academies, and community academies (OECD, 2010). At present, the country has 4,645 HEIs with 286,637 lecturers and 5,725,010 students.[1] Higher-education students can obtain bachelor's, master's, doctorate, and professional degrees or diploma and specialisation certificates from these HEIs.

Indonesian HEIs adhere to the "Three Principles," also known as the "Tri Dharma Perguruan Tinggi"—education, research, and community services. When it comes to improving the quality of education, enhancing teaching and learning processes is important. According to Indonesian law, each HEI develops its own curriculum based on the National Higher Education Standards. This means that every institution needs to focus not only on improving contents, but also pedagogies.

Despite growing awareness of the importance of and progress in implementing student-centered learning and inquiry-based methods, most teachers continue to primarily impart knowledge through lectures. Transitioning teachers from acting as lecturers into becoming facilitators remains a challenge. Turning students into autonomous learners is also difficult due to cultural barriers such as the belief that total obedience is the measure of good conduct or the Manut-lan-miturut philosophy (Dardjowidjojo, 2001). Believers in this philosophy can be likened to yes men in the Western perspective. Students are expected to follow their teachers' instructions without question. This, however, is not applicable in the 21st century and so must be reduced by first modifying the teachers' mind-set to match that of their Western counterparts.

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1   Retrieved from https://forlap.ristekdikti.go.id/ on 22 July 2018.

Current Teaching and Learning Situation in Indonesian HEIs

According to the Education Sector Analytical and Capacity Development Partnership (ACDP) 2013 report, universities and industries—the main agents of innovation development and economy growth—continue to be independent of each other. The fundamental challenges include lack of mutual understanding and trust between the sectors. Many universities develop their strategies without considering industries' future needs and so produce irrelevant graduates. On the other hand, industries see the academe as bureaucratic; they adhere to too many procedures and so attaining mutual understanding with them takes too long. Both sectors need to exert effort to work with each other. Structured encounters via governing boards and joint programmes may be required to drive innovation and, consequentially, economic growth.

Unlike well-developed countries such as the PRC, Korea, Japan, and Singapore, Indonesia also lacks industry support for driving innovation. Indonesian HEIs still need to become strategic institutions founded on a culture of innovation to produce quality graduates that can meet the future requirements of the job market.

Indoped Project, 2016–2018

EU, through the Erasmus+ Programme, funds various activities in the field of education, training, youth development, and sports. These funds can be used to provide incentives for project participants from European institutions and their partners outside the region. In line with the "Europe 2020 Strategy," the Indoped Project promotes cooperation to achieve innovation and the exchange of good practices in higher education to mitigate future unemployment and boost economic growth. Country partners for the project are chosen based on their potential to support external collaboration (Kettunen, 2017).

The Indoped Project aims to add value to the Indonesian higher-education system by updating HEIs' pedagogical approaches and bridging the gap between HEI outputs and industry requirements. TUAS acts as the project's coordinator, aided by other European HEIs, including the Inholland University of Applied Sciences in the Netherlands, the Business Academy Aarhus in Denmark, the University of Gdańsk in Poland, and the University of Seville in Spain. These institutions partnered with five Indonesian universities—Bina Nusantara International University, Syarif Hidayatullah State Islamic University, Syiah Kuala University, Widya Mandala Catholic University, and Yogyakarta State University—and SEAMOLEC for the project.

Each partner has its own strengths. All of the European HEIs are well-known and have had rich experience in implementing pedagogical methods that match industry requirements. As such, they can share much on good pedagogical practices and HEI-industry partnerships. They are also located in different parts of the region and so can bring a much-broader perspective on cultures and values, not just pedagogical approaches. The Indonesian partners also varied (secular, Protestant, Catholic, or Islamic) to represent the diversity of the country's culture and beliefs. They are a mix of public and private HEIs as well. Though they are mainly located in Java, their formal and informal networks cover 34 provinces. SEAMOLEC, meanwhile, was tapped to share the good practices obtained from implementing the project throughout Southeast Asia.

Indonesian HEI Needs Analysis

Before the tried-and-tested European pedagogical approaches were piloted in Indonesian HEIs, the latter needed to go through a self-assessment first. This identified a baseline for adapting relevant practices in each Indonesian HEI. Their needs and readiness were determined based on the assessment results.

The Indonesian HEIs were assessed based on four criteria. First, they must have an urgent need to enhance teaching and learning processes (transitioning to student-centered learning, improving student engagement, and sharpening students' innovation competence). Second, their lecturers expressed lack of confidence in implementing student-centered learning. They need intensive training and mentoring. Third, the gap between their outputs and industry needs was huge and needs to be reduced in the near future. Finally, they need to expand their networks as part of their internationalisation efforts (Hutagaol, et al., 2016).

European Active Learning Practices Pilot Implementations

Good European pedagogical practices, including Project Hatchery, Project Module, Learning by Teaching, Market Research, Rubrics, Gamification, Innovation Camp, Learning through Storytelling, Learning by Case, and Learning to Learn, were piloted in Indonesian HEIs. The European partners conducted teacher training, provided teaching materials and manuals, and planned for and supervised implementations. Between mid-2016 and 2017, more than 100 lectures have been conducted for almost 3,000 participants. A major result of this can be the integration of some programmes' concepts in Indonesian HEIs' curricula. Table 9 provides more information on the pilot implementations.

Table 9: List of European Pedagogical Approaches Piloted in Indonesian HEIs		
Pedagogical Approach	**European University Partner**	**Pilot Implementer**
Project Hatchery	TUAS, Finland	• Bina Nusantara International University • Syiah Kuala University • Yogyakarta State University
Gamification	University of Gdańsk, Poland	• Syarif Hidayatullah State Islamic University • Widya Mandala Catholic University
Innovation Camp	Business Academy Aarhus, Denmark	• Bina Nusantara International University • Yogyakarta State University
Learning through Storytelling	University of Seville, Spain	• Yogyakarta State University
Market Research	Inholland University of Applied Sciences, Netherlands	• Syarif Hidayatullah State Islamic University • Syiah Kuala University
Learning by Teaching	TUAS, Finland	• Bina Nusantara International University • Syiah Kuala University • Widya Mandala Catholic University

Table 9: List of European Pedagogical Approaches Piloted in Indonesian HEIs		
Pedagogical Approach	**European University Partner**	**Pilot Implementer**
Project Module	TUAS, Finland	• Bina Nusantara International University
Learning to Learn	University of Seville, Spain	• Widya Mandala Catholic University
Learning by Case	University of Seville, Spain	• Syarif Hidayatullah State Islamic University • Widya Mandala Catholic University
Rubrics	Inholland University of Applied Sciences, Netherlands	• Bina Nusantara International University

Project Hatchery

Innovation in the Faculty of Technology, Environment, and Business in TUAS is being manifested through hatchery since 2008. This project familiarises students with exploratory work and learning through immersion in a multi-disciplinary team so they can develop their project-development skills. Hatcheries or student teams are expected to identify real-world problems from various perspectives and generate innovative solutions that they will then communicate to stakeholders. The hatcheries students are assigned to depend on their expertise. First-year students are required to take Junior Project Hatchery, which earns them three credits. In this course, they learn various ways to go about their studies and work. It provides them the basic competencies that they will need for their future careers. Content mastery is, however, a secondary requirement of the course, as they are expected to better apply their learnings. After completing the course, the students may choose to join a research or advanced project hatchery of their choice (Kairisto-Mertanen, Räsänen, Lehtonen, and Lappalainen, 2012).

Project Hatchery was piloted in Syiah Kuala University's electronic course under the Agricultural Engineering Department and Dr. Agus Arief Munnawar's supervision. A total of 64 students were grouped into eight hatcheries, which worked with local company, Soccolatte—a manufacturer of cocoa-based products. Students were asked to identify some of the company's problems related to electronics application and suggest possible solutions to these. At the end of the course, the students developed a tool that allowed the manufacturer to rapidly and non-destructively determine the quality of cocoa beans and their predicted fermentation level. In sum, the project helped the students enhance their problem-solving and communication skills and foster teamwork.

Gamification

Gamification sought to integrate game mechanics and dynamics in teaching and learning processes to improve student engagement. It is being implemented in the Faculty of Biology in University of Gdańsk in Poland under the supervision of Drs. Joanna Mytnik and Wojciech Glac. It fostered student-centered learning, which made learners responsible for their own learning. To do that, the students engaged in various activities to master course content. Gamification is also in line with the constructivism paradigm where teachers are considered designers of learning environments while the students hone their own knowledge and skills with the former's assistance. Teachers act as game masters and so use typical gaming concepts such as badges, points, missions, leader boards, challenges, hazards, and others in teaching and learning. Because each game (or lesson) takes time to complete, teachers are encouraged to use several meetings or sessions per activity.

Gamification was piloted in Syarif Hidayatullah State Islamic University's Macroeconomics course under the supervision of Mr. Zuhairan Yunmi Yunan. As a theoretical course, it is always challenging to engage students in lessons. They are, after all, expected not just to understand course content, but also perform simple analyses of national and international economic phenomena. As such, gamification may be a suitable method to improve the students' knowledge by engaging them in activities that help sharpen their critical-thinking skills.

As game master, Mr. Yunan came up with rules that the students needed to follow throughout the course. In one lesson, he used "Malin Kundang"—a well-known folktale from West Sumatra—as background for the motivation exercise. In the story, a mother turned her ungrateful son into stone as punishment. After telling the students the rules of the game, they were asked to perform several course-related tasks so they could turn the son back into human form. Students were awarded points for completing each task. They kept track of their progress through a leader board.

Because the students wanted to win the game, they were more eager to participate in the discussion, asked questions, and shared their thoughts. They learned more. As a result, their mid-term grades were high. None of the students strayed too far above or below the average. In sum, the students successfully engaged in active learning and gained the required knowledge through gamification.

Innovation Camp

Innovation Camp was first introduced in the Business Academy Aarhus in Denmark as an interdisciplinary, dynamic, and practice-oriented course in collaboration with relevant industry partners. It relies on intensive, time-pressured group work that aims to generate and concretise ideas. Real-world challenges based on the experiences of companies, public authorities, and communities were discussed in the camp. Students from various disciplines worked together to understand the stakeholders' situation or context, identify challenges, generate possible solutions, validate their ideas, develop prototypes, and present their findings to their peers. Teachers, meanwhile, acted as facilitators and coaches.

Innovation Camp was piloted by the Faculty of Language and Arts in Yogyakarta State University. It was held for three days in the Wisata Kembang Arum Village. A total of 70 students from 11 different study programmes participated in the camp. They were challenged to come up with non-monetary incentives to encourage the residents of Depok, Sleman in Yogyakarta to reduce, reuse, and recycle solid wastes. The Bremen Overseas Research and Development Association (BORDA), an NGO that focuses on environmental issues within Depok, Sleman, was the camp's main stakeholder. The students were grouped into 12 teams and tasked to discuss and find innovative solutions to solve the problem they identified. The camp helped the students enhance their communication skills and foster teamwork. It also widened their views because they worked with peers from varying disciplines.

Student and Teacher Evaluation of the Pilot Implementations

The pilot implementations were evaluated by both teachers and students. They were asked to complete structured questionnaires before and after the implementations. A total of 627 students from the five Indonesian HEIs completed the questionnaires. A comparison of the pre- and post-implementation results revealed improvements in the students' ability to work systematically, engagement levels, and confidence to lead classroom discussions. The students also showed greater autonomy to explore and obtain information and knowledge from various sources, better collaborated with their teachers and peers to solve problems, and worked well under pressure. They did not only enhance their individual, but also their interpersonal and networking, competencies. After the pilot implementations, in fact, the teachers observed that the students transitioned from being busy individuals into cheerful and friendly partners.

Most of the teachers were satisfied with the pilot implementation results as well. They cited improvements in their professional capacities. They also felt more enthusiastic about using more innovative teaching and learning processes in the future. They also gained more confidence to take initiative and drive others to work together. Overall, the pilot implementations helped them become agents of change in their own HEIs and, hopefully, an inspiration to future Indonesian professionals.

Dissemination of Pilot Implementation Results and Findings

To disseminate the results and findings of the pilot implementations in Indonesian HEIs to other Southeast Asian educators, SEAMOLEC conducted two webinars. The first was conducted in February 2017 after the first phase of the pilot implementations while the second was conducted in November 2017. All of the partners actively contributed to the webinars, which had more than 700 online participants not just from Indonesia, but also from various parts of Southeast Asia. The webinar participants commented that they were inspired by the results of the pilot implementations and hoped to emulate them to improve their own teaching.

The Ministry of Research, Technology and Higher Education (MoRTHE) of Indonesia also provided positive feedback on the Indoped Project. In fact, MoRTHE has become an additional partner. It not only supports the project, but also uses its results and findings in its own programmes. It has, in fact, supported two major Indoped projects to date—the "International Discussion Forum on the Innovation Pedagogy" held in Jakarta in September 2017 (attended by 100 lecturers from various Indonesian HEIs) and the "Indoped International Conference" held in Yogyakarta in March 2018 (attended by more than 240 educators). It also participated in several dissemination activities for local partners since then.

Conclusion

HEIs have a huge role to play in preparing future professionals for challenges. They need to equip students not only with the right knowledge and skills, but also the ability to use, assimilate, produce, and transform their learnings into innovative products or services. They need to help students sharpen their innovativeness by enhancing their critical-thinking skills and creativity, encouraging them to take more initiative, fostering teamwork, and expanding their networks. In the Indonesian HEIs' case, teachers and students need to overcome cultural constraints, create an environment that fosters student autonomy, and involve industries in their RDI activities. The Indoped Project motivated European and Indonesian HEIs to work together to adapt good European pedagogical approaches to improve the quality of the Indonesian higher-education system. Several research efforts and other activities are currently ongoing to further extend the project's benefits in Indonesia.

Note: The authors would like to thank the participants in the various Indoped Project programmes without whose valuable inputs the writing of this article would not be possible. We will continue to monitor and report further findings in the future since the project is still ongoing.

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Fostering Global Citizenship in Statistics Education

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Abstract

GCED has been a primary theme of educational goals and policies for the past few years. In a society where data has become pervasive, data literacy has become crucial to support global citizenship. Yet very little effort has been exerted to incorporate global citizenship into statistics education. Statistics education often does not go beyond memorising formulas and procedures and so fails to promote global citizenship. This article reports on the development and implementation of a cross-border lesson on statistics in the context of energy conservation that aims to promote global citizenship through data literacy. Thirty-two English-speaking eighth-grade students each from Indonesia and Thailand participated in the lesson via the WebEx video-conferencing platform. Data was collected based on video recordings and students' written work. Data analysis revealed that the use of real-life data, meaningful context, and cross-border collaboration in statistics has great potential to increase student engagement and nurture their sense of global citizenship.

Introduction

In the 21st century, data has become inseparable from daily activities. Statistics lessons in school offer ample potential to help students become data-literate citizens. However, such lessons often do not transcend the confinement of classrooms and textbooks, at least in Indonesia. Bakker (2007) told an interesting story about a student citing statistics as "mean-median-mode," clearly thinking of it as only being about formulas to apply to a bunch of numbers, completely void of purpose and meaning.

Amidst an increasingly globalised and interconnected world, it is important for people to not only see themselves as part of their own tribe, but also as global citizens. Global citizenship has been widely discussed with regard to educational goals and policies in the past few years.

GCED refers to a framework that aims to develop students' sense of global citizenship. It can take either a curricular or an extracurricular approach. The curricular approach often offers global citizenship as a stand-alone subject or embeds related concepts in subjects such as ethics, civics, or religion (UNESCO, 2014). Very few studies have reported attempts to embed GCED into mathematics, especially statistics.

Statistics has a lot of potential to help students develop a sense of global citizenship. To become a global citizen, one needs to be aware of issues from around the world and communicate and cooperate with others to resolve them. Because numerical data largely comprises information these days, data literacy has become increasingly important. Strong data literacy can thus enhance GCED but efforts to improve data literacy need to start by innovating statistics lessons.

This article describes the development and implementation of a statistics lesson that aims to foster global citizenship through data literacy. Students were tasked to analyse and critically think about given data then use it in an argument. To engage the students, tasks need to be made exciting, meaningful, and worth doing. We attempted to achieve this by incorporating genuine, real-life data, meaningful contexts, and cross-border collaboration into the lesson.

Literature Review

Data Literacy to Support Global Citizenship

Data literacy is defined as the ability to derive meaningful information from numbers, including accessing, assessing, manipulating, summarising, and presenting information (Schield, 2004). In the field of statistics education, data literacy may not be as well-known as statistical literacy — the ability to critically digest statistical information in daily life and use it as evidence in arguments (Schield, 1999).

People often interchange data literacy with statistical literacy, which is understandable because the two are interrelated. Analysing data, especially big data, can be quite complex and requires a strong foundation in mathematics and statistics. Note though that statistics summarises data and so demands sufficient ability to work with numerical information. Seeing that most information today uses data and statistics, data literacy has become inseparable from statistical literacy (Schield, 2004 and Prado and Marzal, 2013).

To improve data literacy, classroom activities need to be inclusive, use data that is relevant to learners, and offer many possibilities for unexpected outputs (Bhargava and D'Ignazio, 2015). They need to let students use their ability to explore complex issues and construct their own understanding.

GCED, meanwhile, hopes to give students a better sense of belonging to a broader community and a common humanity (UNESCO, 2013). As opposed to the administrative nature people often associate with citizenship, global citizenship refers more to a holistic perspective on what it means to be a global individual. This notion is increasingly gaining relevance as the world increasingly becomes globalised, interdependent, and interconnected.

GCED requires practices that nurture the said perspectives in students. It comprises three core conceptual dimensions—cognitive, socio-emotional, and behavioural (UNESCO, 2015).

Table 10: Core Conceptual Dimensions of GCED		
Cognitive	**Socio-Emotional**	**Behavioural**
To gain knowledge and understanding of and critically think about global, regional, national, and local issues, along with the interconnectedness and interdependency of different countries and populations	To foster a sense of belonging to a common humanity, sharing values and responsibilities, empathy, solidarity, and respect for differences and diversity	To act effectively and responsibly at the local, national, and global levels for a more peaceful and sustainable world

GCED aims to encourage learners to critically analyse real-life global issues and identify possible creative and innovative solutions for them while empowering them to develop sense of agency and take an active role in solving global challenges on a local or global scale (UNESCO, 2013). It can take a curricular or an extracurricular approach. In the curricular approach, it takes the form of a stand-alone subject or is embedded in an existing subject (UNESCO, 2013).

GCED is part of the SDGs (UNESCO, 2017), a set of 17 goals formulated by UN hailed as necessary for collective humanity to achieve by 2030. The goals encompass social and economic issues that affect humanity on a global scale. Amongst these is partnership, which is necessary if we are to solve global issues and reach global goals.

GCED strongly emphasises engaging students in real-life global issues. They need to be aware of and understand important issues that affect the world and communicate and cooperate with people from different cultures to solve problems. As data comprises most information today, the ability to handle and communicate said data has become crucial for students to fully understand global issues. As such, students need to develop strong data literacy if they are to truly and successfully become global citizens.

Previous research in mathematics education reported attempts to enhance awareness of and develop a sense of agency about significant and noteworthy real-life issues. Gutstein and Chicago (2003) reported how math lessons helped students in an urban Latino school build their knowledge and understanding of social justice. Lesser (2007), meanwhile, described the potential of statistics to incorporate issues related to social justice.

Real-Life Data Sets in Meaningful Contexts

Real-life data is acquired from real-life situations. This includes archival data, data collected from research, and classroom-generated data (Neumann, Hood, and Neumann, 2013). Consequently, real-life data is often messy, unfriendly, and comprises big numbers, which can be intimidating and difficult for students to manipulate. Teachers often avoid using real-life data in lessons and opt instead for artificial data. As opposed to real-life data, artificial data is collected through simulations or generated by teachers based on hypothetical situations. Teachers can design this kind of data to be easily decipherable for students.

To make statistics more meaningful, classroom instruction needs to be made as similar to real-world situations as possible. One way to do this is to put real-life data sets in the learners' context (Bidgood, 2010). This will make learning richer and more challenging and motivating for students who may already be struggling with statistical techniques (Libam, 2010). The numbers used should be easy to manipulate so working with data is no longer procedural, but instead requires critical thinking and reasoning.

Data essentially refers to numbers with context as opposed to artificial data, which requires teachers to create contexts for. Though real-life data already has context, teachers still need to ensure student engagement. As such, complex problems that contradict the students' prior beliefs (Ben-zvi, Gil, and Apel, 2007), along with contexts that combine perspectives from different disciplines, should be avoided.

Many studies have reported positive results on using real-life data in statistics. The "Guidelines for Assessment and Instruction in Statistics Education" (GAISE) (Franklin, et al., 2007) states that using real-life data can contribute to more successful statistics lessons. Hourigan and Leavy (2015) also reported that fifth-grade students were better engaged in describing and comparing likelihoods in activities that used real-life data. Libam (2010) and Neumann, et al. (2013) found the same thing.

Students can even collect real-life data on their own using different methods. If this is, however, too time-consuming, various reliable online databases are available at no cost. Many international institutions such as UN, OECD, and WB provide such kind data for free online.

Cross-Border Collaboration

Technological developments offer endless possibilities to mathematics classrooms. Software, apps, and animation are just some of the latest technologies that can help teachers deliver more attractive, engaging, and livelier math lessons. In our research, we used synchronous communication technology.

Synchronous communication technology enables real-time communication. It includes text messaging, chat rooms, audio and/or video conferencing, and shared white boards (Chiu, Yang, Liang, and Chen, 2008). These have become pervasive in distance education. Software such as Adobe Connect, Blackboard Collaborate, and WebEx are some of the most widely used in education.

The rationale behind incorporating synchronous technology use in teaching stems from putting global issues in a local context. Global issues do not concern only one country or community; they transcend cultural and geopolitical boundaries. As such, students should discuss them with people from different countries, which supports the goal of GCED, especially with regard to the socio-emotional and behavioural domains.

International communication through synchronous technology use is also known as cross-border collaboration. This allows students from different countries, cultures, and time zones to participate in the same math lesson via a video-conferencing technology, for instance.

Research

Research Setting

This project is part of the Asia-Pacific Economic Cooperation (APEC) Lesson Study Project initiated by the University of Tsukuba and Khon Kaen University in 2006, which aims to develop more innovative teaching practices in mathematics.

The "Cross-Border Lesson Study" began in 2016 and continued on until 2017. In it, members were grouped in pairs to design and conduct cross-border lessons. Indonesia was paired with Thailand. A team of academics from SEAQIM in Indonesia and Khon Kaen University in Thailand worked together to design a statistical task that was implemented as a cross-border lesson.

Some 32 English-speaking eighth-grade students each from Indonesia and Thailand participated in the lesson. One math teacher from each country acted as model teachers. The lesson was taught in two meetings, the first of which was run separately in Indonesia and Thailand. A week after, the second meeting, which used WebEx, was conducted with all of the participants from both countries.

The Lesson Taught

The lesson featured data from the APEC energy database, which contained information on the energy production and consumption of member countries and economies, available at no cost from http://www.egeda.ewg.apec.org/.

The context given was that energy use had to do with electricity consumption and carbon-dioxide emission. Though the students would easily relate to using electricity, the same cannot be said about carbon-dioxide emission. As such the concept of carbon footprint was discussed.

Energy conservation is a global issue that transcends geopolitical borders and cultural boundaries, making it a suitable topic for promoting global citizenship. The task involved using data from several countries—Indonesia, Thailand, the U.S., and the PRC. Adding the U.S. and the PRC, which were extreme cases, to the list made it easier for students to see patterns and relationships.

The lesson aimed to teach students to represent energy-related data in chart form, interpret data in the context of energy conservation, and explain the correlation between energy consumption and carbon-dioxide emission.

During the first meeting, the students worked on electricity consumption data from Indonesia and Thailand. They were asked to present the data in chart form then describe and explain trends shown in the graph. The numbers were left in kiloton of oil equivalent (KTOE), a unit representing the energy generated by burning 1,000 tons of crude oil. They referred to country-level consumption rates and so the students had to work with large numbers, something they did not normally do in statistics lessons.

After creating charts, the students were asked to discuss their work in groups. They were, however, limited to form a group with peers from the same country as theirs. They were asked to determine the correlation between electricity consumption and population. They produced charts similar to Figure 10 below.
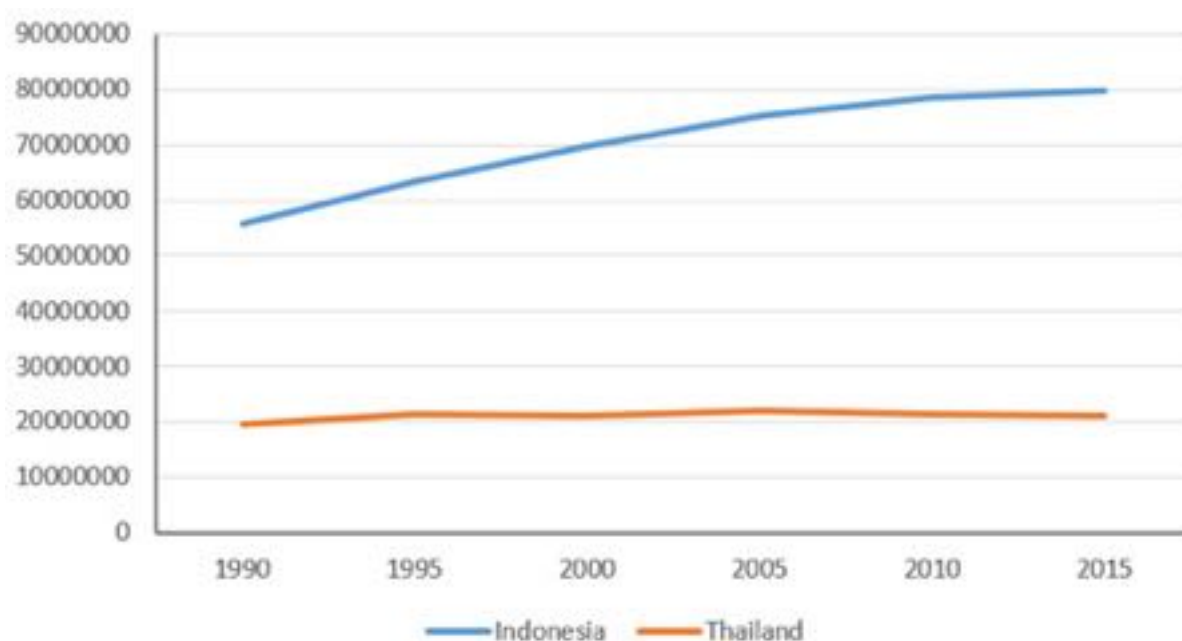
Figure 10: Comparison of the population of Indonesia and Thailand

During the second meeting, the students from Indonesia and Thailand were asked to communicate with one another using synchronous communication technology, specifically via a WebEx video conference.

They were first shown two line charts (see Figure 11)—one comparing the electricity consumption of Indonesia and Thailand while the other showed their carbon-dioxide emission levels. At a glance, the charts looked to share the same trend, which implied a direct correlation between energy consumption and carbon-dioxide emission.
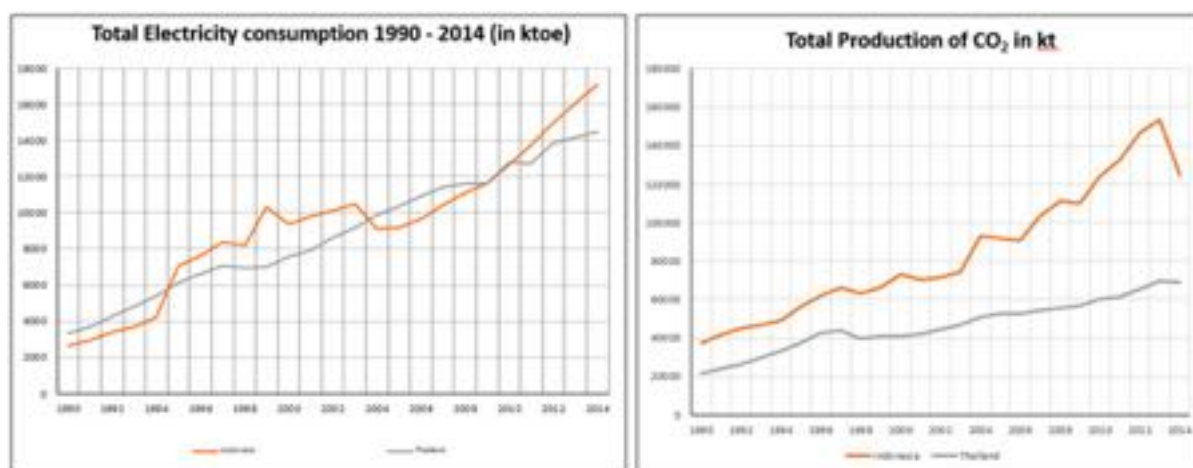
Figure 11: (Right) Comparison of the electricity consumption in Indonesia and Thailand;
(left) comparison of the carbon-dioxide emission levels in the same countries

The teacher then challenged the students' initial assumption. To explore possible relationships between the two variables, the students were asked to look at four more charts (see Figure 12) showing Indonesia, Thailand, the U.S., and the PRC's total electricity consumption, sources of electrical energy, coal consumption, and carbon-dioxide emission levels.
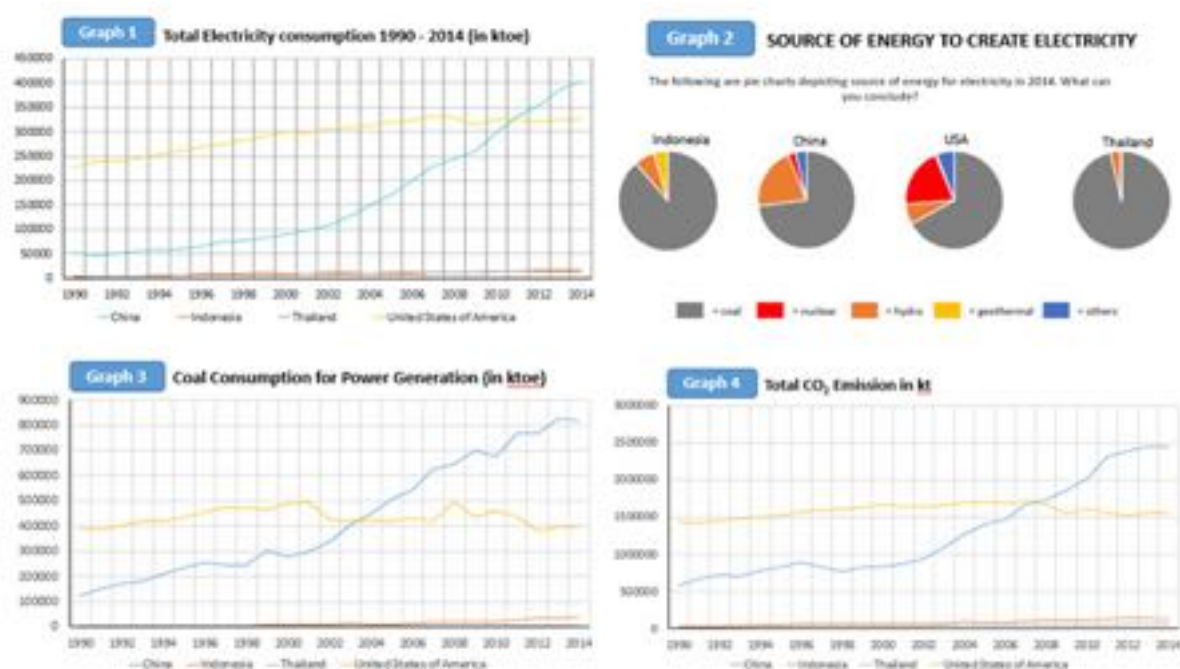
Figure 12: Additional charts comparing Indonesia, Thailand, the U.S., and the PRC

The students were asked to analyse the charts visually then discuss their thoughts with peers. They were then asked to present their findings to the whole class and even share their learnings with friends from other countries.

Research Results and Findings

The first lesson started by showing the students an image depicting the pollution on earth represented by lights (taken from http://blue-marble.de/nightlights/2012), zooming in to Indonesia and Thailand. It showed that Thailand was significantly brighter than Indonesia, except Sumatra and Java. It should be noted though that Indonesia covered a bigger area than Thailand. They were then asked which country consumed more electricity and what factors affected their electricity consumption.

Answers were then discussed. The students exchanged views with their peers. Most thought Indonesia consumed more electricity because Sumatra and Java were brighter than Thailand. They equated the number of lights to population. In general, they believed that a country's population was directly proportional to its electricity consumption.

The teacher reminded them that no matter how sound their arguments were, their answers were merely assumptions and need to be backed up by data. Afterwards, the teacher gave the students a worksheet that showed how much electricity Indonesia and Thailand actually consumed from 1990 to 2014 (see Figure 13). The students were then asked to plot a line chart using the data they received then answer the same questions they were asked earlier.
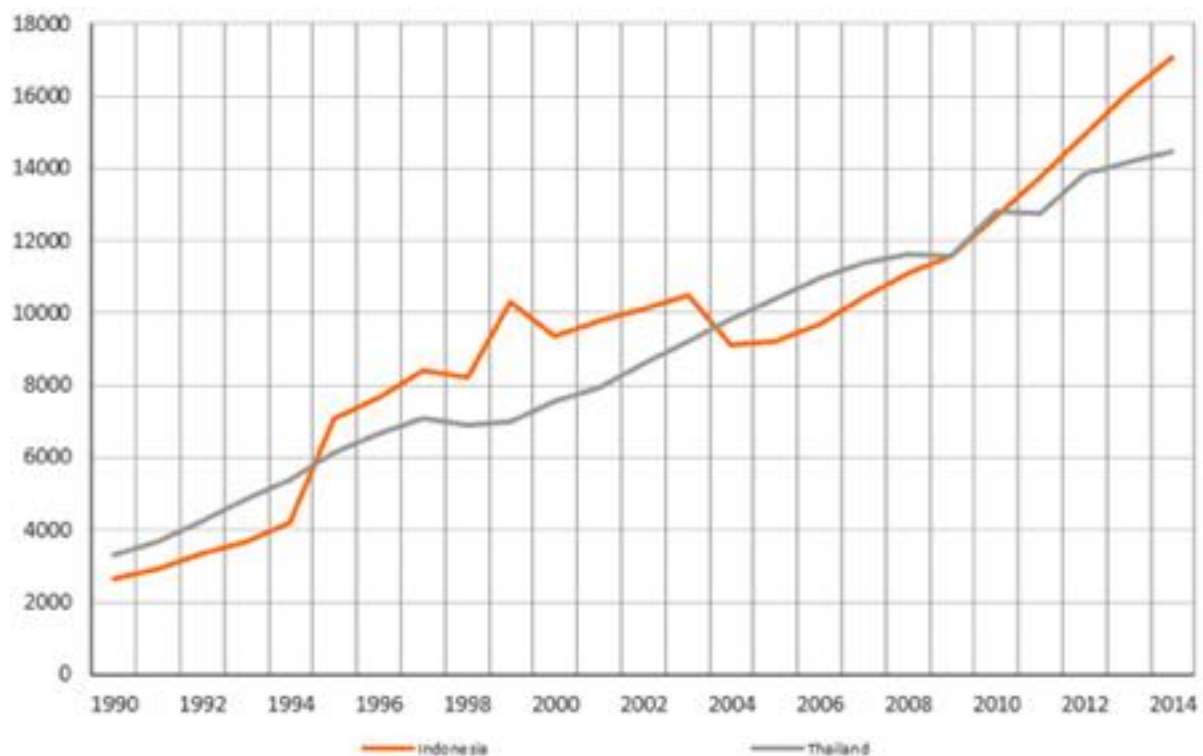
Figure 13: Comparison of electricity consumption in Indonesia and Thailand

The chart showed that Thailand and Indonesia consumed roughly the same amount of electricity. As the students struggled to match the new information with their initial assumption, the teacher showed them the chart comparing the countries' population (see Figure 10). It showed that Indonesia's population far exceeded that of Thailand. Again, this did not match their initial assumption—electricity consumption was not directly proportional to population. A heated discussion of unseen factors then ensued. They worked together to find out why the facts did not meet their expectations.

At the end of the lesson, the students concluded that electricity consumption was not proportional to population because not every individual consumed the same amount of electricity. Developing countries with more successful industries and better access to technology will consume more electricity even if they had a tiny population.

The second meeting started with a review of the events that transpired during the first one. Since the students from both countries worked on the same data, it was more interesting to note how they shared their thoughts and communicated with others.

They were then asked if electricity consumption was related to carbon-dioxide emission. Most students did not think so. This could be due to prior knowledge from their science classes. Some were, however, unsure because the related charts in Figure 12 seemed to show some level of correlation.

The teacher asked the students if they foresee any unexposed variables before asking them to look more closely at the charts in Figure 12. The students mainly performed exploratory data analysis, that is, looked at data to identify trends and form hypotheses.

The students found that the electricity consumption of the U.S. and the PRC followed a similar trend just like data from Indonesia and Thailand showed likenesses. A notable dip in the U.S.'s carbon-dioxide emission level was seen near 2014, which may have something to do with the increase in its coal consumption. To confirm, they looked at the country's source of electrical energy, which indicated a shift towards clean energy (hydro and nuclear). This prompted the students to conclude that the volume of electricity consumed by a country did not affect its carbon-dioxide emission, what mattered more was where they obtained the energy to create electricity.

Apart from the charts, the students were also given a worksheet to complete so they can form their own conclusions about the correlation between electricity consumption and carbon dioxide emission. The students concluded that the PRC used more coal than the U.S. and so it had a higher carbon-dioxide-emission level. Additional data (from the U.S. and the PRC) and guidance helped the students better notice trends and relationships between countries and the factors they were scored on.

In sum, the lesson helped the teacher better explain how important data literacy was in understanding the world around us while building strong and sound arguments. Most of the students appreciated the fact that the problem they were given in class was an important global issue because they were able to share their thoughts with people from a different country in hopes that they can work together to resolve the issue.

Conclusion

Data literacy is crucial to support GCED. Yet very little effort has been exerted to incorporate GCED into statistics education. Statistics education mostly focuses on memorising formulas and learning the procedural way of handling data. To develop students' data literacy and, in turn, foster global citizenship, statistics needs to be enhanced by using real-life data set in meaningful contexts and using cross-border collaboration.

Data literacy is the ability to derive meaningful insights from data, including accessing, assessing, manipulating, summarising, and presenting information (Schield, 2004). Students need to be able to relate to given data if they are to derive meaningful insights off it. Using real-life data in lessons not only challenges students, but also makes them care more about solving the problem. They are more invested in working on a data-driven problem that can affect their lives.

Applying the right context to data is also important. In the sample lesson, energy conservation was the global issue used because it goes beyond geographical and jurisdictional borders. Through cross-border collaboration, the students became aware that energy issues affected everyone worldwide and as global citizens, they can become agents of change to solve the problem.

Teachers can explore other core dimensions of global citizenship and use other global issues for their lessons. They are also encouraged to explore other data sources and methods to conduct statistical investigations. Cross-border collaboration in school can also open more opportunities for teachers and students alike to work with their peers in other countries.

The findings presented in this article were limited to conducting one lesson. We did not have the luxury of time to test our thesis in other topics or subjects. Challenges due to a language barrier were also encountered but successfully managed.

Note: The authors would like to express their deepest gratitude to the teachers, students, and schools who participated in this endeavour.

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The Ability of High-School Students to Solve STEM-Related Problems

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Abstract

STEM education has become an important issue for Southeast Asia in the 21st century. This article investigates high-school students' ability to solve STEM problems through a quantitative study. We asked students to answer 10 STEM questions. Their responses were then reviewed, validated, and statistically analysed using the Rasch model by experts from a college. Some 301 11th-grade students from five elementary schools in West Java participated in the study. The questions tested four levels of student cognitive dimension—understanding, applying, analysing, and evaluating. Our statistical analysis showed that the STEM questions used were reliable with a reliability score of 0.93 and so they were fit or acceptable compared with the normal standard. The construct's validity was analysed using the infit and outfit mean square (MNSQ) values. With that, we determined that the instrument was valid. The statistical analysis showed that the students had a low ability to solve STEM problems, particularly when it came to the cognitive dimension. The study provided an overview of the students' ability to solve STEM problems and so is expected to serve as a reference for teachers when planning and designing their own lessons.

Introduction

The 21st century is characterised by ICT taking a central role in all aspects of people's lives. Technology connects everyone around the world, transcending geographical barriers and creating a borderless community. Technological developments have improved the quality of products and services and, as a result, life as we know it. This, however, requires a better and more competent workforce. The 21st century is marked by scattered information and ever-evolving technologies. Today, the world of science has become increasingly interconnected, resulting in better synergy. Various efforts to improve the quality of education are constantly being exerted, including redesigning curricula, developing new teaching and learning approaches, structuring content, and determining the competencies required to fit current situations and conditions.

Badan Standar Nasional Pendidikan (BSNP) or the National Education Standards Agency states that the primary educational goal for the 21st century is to embody the goals of the nation—producing blissful and prosperous citizens that are respected and can compete with those from other countries. As such, BSNP hopes to produce qualified HR who are self-reliant and willing to and capable of turning the ideals of the country into reality (Mukminan, 2014 and Daryanto and Karim, 2017). The Ministry of Education and Culture (MoEC) kept this goal in mind when it developed curricula for elementary, junior- and senior-high, and vocational schools. It also strives to incorporate 21st-century skills, scientific approaches, and learning and authentic assessment in curricula (Daryanto and Karim, 2017). Developing 21st-century skills leads to enhancing other growth-oriented learning skills, including to think, act, and live in the real world. According to Trilling and Fadel (2009), students must possess life and career, self-learning and innovation, and media information and technology skills in the 21st century.

A number of developed countries have been instigating reforms and innovations to make education more responsive to the need for 21st-century skills. And these reforms and innovations include promoting STEM education (Kuenzi, 2008). STEM education was first introduced by the U.S. National Science Foundation (NSF). Since then, it has been promoted in other countries. Indonesia has just recently introduced STEM education. In STEM education, science deals with the study of natural phenomena using observation and measurement to objectively explain environmental changes. Science, in this case, includes physics, biology, chemistry, and earth and space sciences. Technology, on the other hand, deals with human innovations that can be used to modify nature to help humans address their needs and improve their lives. Engineering, meanwhile, should address the need to acquire and apply science, social, economic, and practical knowledge to design and construct machines, tools, systems, materials, and processes that will benefit human beings. Finally, mathematics should provide people with knowledge of patterns and relationships and a means to understand the language of technology, science, and engineering (Firman, 2017).

Science in STEM education usually refers to natural sciences, but it can also be extended to include social sciences. STEM education actually aims to attract students to STEM-related careers that will characterise the 21st century. Focus on STEM education arises from the fact that learning mathematical and scientific concepts is no longer enough to become modern citizens who need to relate knowledge of these to technology and engineering (Chesky and Wolfmeyer, 2015). STEM education hopes to develop learners' problem-solving skills to deal with STEM-related challenges that can arise in their daily lives (Bybee, 2013).

STEM education will, however, become meaningless if the fields are separately reinforced. Hence, developing an educational approach that addresses all four components of STEM education to teach citizens to address real-life problems is necessary. For primary- and secondary-level students, this means improving their STEM literacy (Bybee, 2013). They should:

- Acquire the necessary knowledge, attitudes, and skills to identify problems, explain natural phenomena, and draw conclusions based on objective evidence

- Understand how imbibing the STEM discipline can enhance human knowledge and investigation and design skills

- Enhance awareness of how STEM can enhance the material, intellectual, and cultural environments

- Increase their willingness to participate in solving related issues such as energy conservation, environmental quality, and natural resource constraints as constructive, caring, and reflective citizens who rely on STEM-based ideas

STEM education requires teachers not only to equip students with scientific knowledge, but also develop their soft and critical-thinking skills or ability to analyse, assess, and improve their thinking (Paul, 2008). Following the STEM education approach can respond to a wide range of daily problems and challenges, including those related to population, economic, social, and political issues (Pattanapichet and Wichadee, 2015 and Forawi, 2016). In addition to addressing workforce issues, STEM education will also benefit the general public with a collective of citizens that have the skills and knowledge to live better lives by making the right personal decisions (Urban and Falvo, 2016).

Several studies on using technology to improve STEM education have been published. More in-depth research, however, is still needed to deepen our understanding of STEM education and enrich teaching and learning approaches to benefit the future workforce. This includes finding out if today's students have the four abilities mentioned earlier. The ability to solve STEM problems reflects students' critical-thinking skills because the act requires them to analyse and assess factors to resolve issues. Teachers can use the study's results to design a learning process that integrates all of the necessary STEM components.

This article features our preliminary research on STEM education in high school. We asked the students from West Java STEM questions to test how prepared they are for 21st-century careers. We analysed the results using the Rasch model via the Winstep software (Khotimah and Sri, 2014). Compared with other validation methods such as the classical test theory, the Rasch model can predict missing data based on a systematic response pattern. This will produce a more accurate statistical analysis of test results despite missing data.

Research Methodology

Some 301 11th-grade students from five elementary schools in West Java participated in the study. Students were asked to participate in a STEM learning activity then answer an online questionnaire prepared by teachers who underwent SEAQIS training on STEM education. The questions tested students' understanding, applying, analysing, and evaluating cognitive skills.

In this study, a Rasch measurement model software—Winstep version 3.73—was used for dichotomous responses (items with only two potential responses—true or false). The Rasch model transforms raw item difficulties and raw person scores to equal interval measures of logits on a line in a "metre stick." This helps determine how much attention should be given to each item, depending on its position relative to those of others. Chan, et al. (2014) cited seven advantages of using the Rasch model, including:

- It can evaluate if the items used are appropriate and if biases can be identified.

- Item calibration is not affected by a person's ability.

- The calibration standard error can be exploited to examine the accuracy of each item.

- The model can predict how difficult an item is and make it less so using a standard scale.

- Respondents' abilities can be compared with one another even if they do not answer the same items by using a common scale for ability estimation.

- The Chi-square of person fit can be used to assess the quality of measurement.

- The model can improve the construction and design of a test so assessment can be easily adjusted.

In the study, an instrument was deemed good if it had high validity and reliability scores. In the Rasch model, the indicators that should be observed to determine reliability are referred to as the Cronbach Alpha, which measure a person's and an item's reliability (Saad, et al., 2011). Table 11 shows the ranges of reliability measurements in the model. The indicators that should be observed to determine validity, meanwhile, are values of point measure correlation and MNSQ values (Mohamad, et al., 2015). The reliability scale used in the study was based on a rating scale instrument developed by Fisher (2007).

Table 11: Person and Item Measurement Reliability	
Reliability Measurement	**Range**
Poor	< 0.67
Fair	0.67–0.80
Good	0.81–0.90
Very Good	0.91–0.94
Excellent	> 0.94

Research Results and Findings

All of the data collected was analysed using the Rasch measurement model software, Winsteps version 3.37. Statistics was used to measure the test's reliability by analysing the consistency between items. A higher value indicates a strong relationship between items in the test whereas a small value indicates a weak relationship.

```
INPUT: 301 PERSON   10 ITEM   REPORTED: 301 PERSON   10 ITEM   2 CATS   WINSTEPS 3.73
-----------------------------------------------------------------------------------

        SUMMARY OF 301 MEASURED PERSON
-----------------------------------------------------------------------------------
|              TOTAL                           MODEL        INFIT         OUTFIT    |
|              SCORE     COUNT     MEASURE      ERROR      MNSQ  ZSTD    MNSQ  ZSTD  |
|----------------------------------------------------------------------------------|
| MEAN          2.7      10.0       -1.27        .89                                |
| S.D.          1.7       .0         1.10        .34                                |
| MAX.          9.0      10.0        2.32       1.86                                |
| MIN.           .0      10.0       -3.62        .66        .69  -1.7    .44  -1.7  |
|----------------------------------------------------------------------------------|
| REAL RMSE     .97 TRUE SD     .52  SEPARATION    .54  PERSON RELIABILITY  .22     |
|MODEL RMSE     .95 TRUE SD     .55  SEPARATION    .58  PERSON RELIABILITY  .25     |
| S.E. OF PERSON MEAN = .06                                                         |
-----------------------------------------------------------------------------------

PERSON RAW SCORE-TO-MEASURE CORRELATION = .97
CRONBACH ALPHA (KR-20) PERSON RAW SCORE "TEST" RELIABILITY = .37

        SUMMARY OF 10 MEASURED (NON-EXTREME) ITEM
-----------------------------------------------------------------------------------
|              TOTAL                           MODEL        INFIT         OUTFIT    |
|              SCORE     COUNT     MEASURE      ERROR      MNSQ  ZSTD    MNSQ  ZSTD  |
|----------------------------------------------------------------------------------|
| MEAN         81.1     301.0         .00        .15      1.00    .0   1.01    .2   |
| S.D.         27.6       .0          .56        .01       .10   2.0    .16   2.3   |
| MAX.        137.0     301.0         .77        .17      1.22   4.8   1.39   6.3   |
| MIN.         46.0     301.0       -1.05        .13       .84  -3.3    .80  -2.7   |
|----------------------------------------------------------------------------------|
| REAL RMSE     .15 TRUE SD     .54  SEPARATION  3.60  ITEM  RELIABILITY    .93     |
|MODEL RMSE     .15 TRUE SD     .54  SEPARATION  3.66  ITEM  RELIABILITY    .93     |
| S.E. OF ITEM MEAN = .19                                                           |
-----------------------------------------------------------------------------------
```

Figure 14: Output data from the instrument's analysis

Figure 14 shows the output data from the analysis of the instrument used in the study. The person's reliability score was 0.22 while the item's was 0.93. The person separation index was 0.54 while the item separation index was 3.60. Using the rating scale in Table 11, the person's reliability was poor. And based on Fisher's scale (2007), the person separation index value was also poor. The results reflect the instrument's low sensitivity to distinguish between high and low performers. This could be due to its low quality or the small number of test items (Rashidi, et al., 2014 and Abell and DeBoer, 2015). To increase a person's reliability, the students' ability ranges need to increase and more items should also be added to the test (Chen, et al., 2014).

Unlike the person reliability score, the item reliability and item separation index scores were good. This shows that the instrument worked well in terms of performing further analysis. The instrument can, however, categorise the items based on difficulty—lower, moderate, and upper—to become more reliable with regard to measuring given constructs.

The test items in the study were considered a reliable measuring instrument based on initial analysis. They were validated by experts from a university to see if they match the scientific concepts the study hopes to use. They were also analysed for accuracy. An item was considered valid if it corresponded to a scientific concept taught in class or is compatible with one in the science curriculum (Firman, 2000). Validation was a vital component of the study because it ensured the test's ability to evaluate students' ability to solve STEM problems. The validity test assessed the instrument in relation to set criteria, content, and construct (Swerdlik, 2009). The instrument should match the subject's content. Experts from a college were asked to evaluate the content validity of the questions. Construct validity allowed the users to determine if the scores of the instrument were significant, meaningful, useful, and purposive. Three misfit patterns were considered in assessing the construct validity of an item using point measure correlation and MNSQ.

ENTRY NUMBER	TOTAL SCORE	TOTAL COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	ZSTD	OUTFIT MNSQ	ZSTD	PT-MEASURE CORR. EXP.	EXACT MATCH OBS% EXP%	ITEM
10	137	301	-1.05	.13	1.22	4.8	1.39	6.3	A .27 .45	58.1 64.9	310
6	75	301	.07	.14	1.06	.9	1.10	1.0	B .32 .37	73.5 74.3	36
2	51	301	.64	.16	1.01	.1	1.07	.6	C .31 .32	81.6 81.9	32
5	52	301	.61	.16	1.05	.5	1.03	.3	D .29 .32	82.0 81.6	35
8	46	301	.77	.17	1.03	.3	1.02	.2	E .29 .31	82.0 83.5	38
1	96	301	-.33	.14	.98	-.5	.98	-.3	e .42 .40	71.3 69.0	31
9	91	301	-.24	.14	.97	-.4	.95	-.6	d .42 .39	73.2 70.2	39
7	103	301	-.46	.13	.95	-1.1	.93	-1.1	c .46 .41	71.0 67.4	37
3	62	301	.36	.15	.88	-1.5	.80	-1.7	b .44 .34	82.0 78.3	33
4	98	301	-.37	.14	.84	-3.3	.82	-2.7	a .53 .40	77.2 68.5	34
MEAN	81.1	301.0	.00	.15	1.00	.0	1.01	.2		75.2 74.0	
S.D.	27.6	.0	.56	.01	.10	2.0	.16	2.3		7.2 6.5	

Figure 15: Item-specific statistics

Point measure correlation statistics was then used to check if all of the items in the test worked towards achieving the same goal. Figure 15 shows that all of the test items had positive values, which indicated their acceptability (Bond and Fox, 2007). These indicated the measured items' parallelism with the test's construction. The MNSQ scores of all items were between 0.82 and 1.39. None of them needed to be modified or removed.
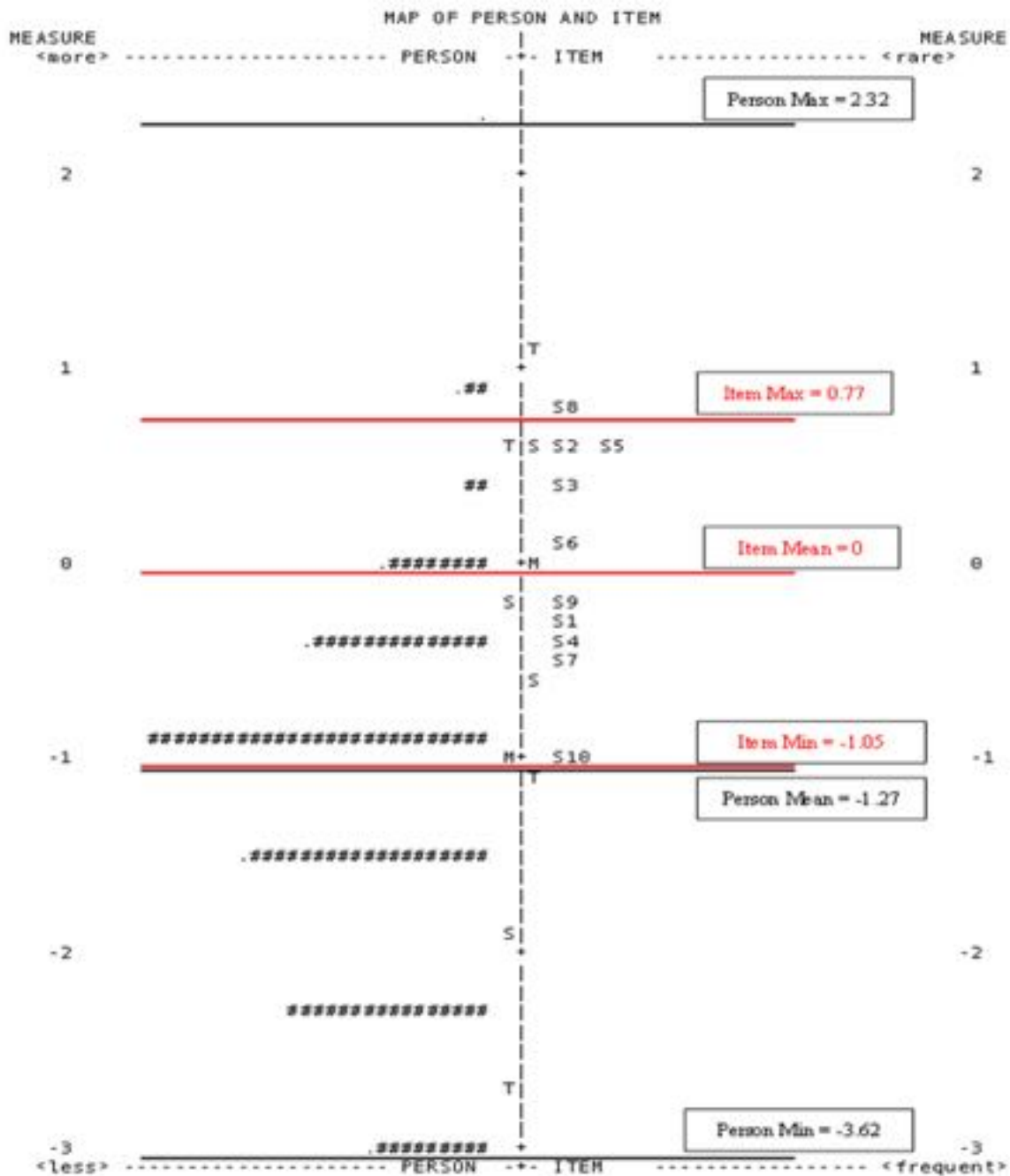
Figure 16: Variable map

In Figure 16, the number signs and periods on the left represented the students. Each number sign represented three students while each period stood for 1–2 students. The variable map, also known as the "Wright Map," correlates students' ability (person) with the level of difficulty of each given problem (item). Students were scored based on their ability. The less able they were, the lower they were on the scale. The items on the right were also arranged from easiest (lowest portion) to hardest (topmost portion). The more difficult a problem (item) was, the higher it was on the scale.

Zero referred to average student ability (left) and test difficulty (right). As shown, the average for student ability was lower than that for test difficulty, indicating that the tests were, on average, relatively difficult for the students. Most of the students (86.71%), were in fact, below average. The logit values that their ability to solve STEM problems was low because they were not able to correctly answer the questions.

ENTRY NUMBER	TOTAL SCORE	TOTAL COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%
242	9	10	2.32	1.07	1.20	.51	3.00	1.71	-.62	.15	90.0	90.0
78	7	10	.91	.71	.89	-.31	.84	-.31	.45	.24	70.0	70.0
80	7	10	.91	.71	.89	-.31	.84	-.31	.45	.24	70.0	70.0
248	7	10	.91	.71	1.04	.21	1.28	.61	.08	.24	70.0	70.0
268	7	10	.91	.71	1.13	.51	1.37	1.01	-.08	.24	70.0	70.0
274	7	10	.91	.71	1.00	.11	1.24	.71	.14	.24	70.0	70.0
277	7	10	.91	.71	1.13	.51	1.37	1.01	-.08	.24	70.0	70.0
279	7	10	.91	.71	1.00	.11	1.24	.71	.14	.24	70.0	70.0
297	7	10	.91	.71	1.17	.61	1.40	1.11	-.13	.24	70.0	70.0
77	6	10	.44	.67	1.10	.61	1.21	.91	.03	.26	70.0	63.5
144	6	10	.44	.67	1.03	.21	1.01	.11	.21	.26	50.0	63.5
							shortened					
229	1	10	-2.32	1.07	1.00	.31	.80	.11	.22	.17	90.0	90.0
230	1	10	-2.32	1.07	.98	.31	.74	.11	.27	.17	90.0	90.0
232	1	10	-2.32	1.07	1.17	.51	1.98	1.11	-.36	.17	90.0	90.0
233	1	10	-2.32	1.07	1.17	.51	2.03	1.11	-.38	.17	90.0	90.0
240	1	10	-2.32	1.07	1.17	.51	2.03	1.11	-.38	.17	90.0	90.0
243	1	10	-2.32	1.07	1.03	.31	.90	.21	.14	.17	90.0	90.0
260	1	10	-2.32	1.07	1.03	.31	.90	.21	.14	.17	90.0	90.0
290	1	10	-2.32	1.07	1.17	.51	2.03	1.11	-.38	.17	90.0	90.0
7	0	10	-3.62	1.86	MINIMUM MEASURE				.00	.00	100.0	100.0
11	0	10	-3.62	1.86	MINIMUM MEASURE				.00	.00	100.0	100.0
							shortened					
194	0	10	-3.62	1.86	MINIMUM MEASURE				.00	.00	100.0	100.0
205	0	10	-3.62	1.86	MINIMUM MEASURE				.00	.00	100.0	100.0
210	0	10	-3.62	1.86	MINIMUM MEASURE				.00	.00	100.0	100.0
223	0	10	-3.62	1.86	MINIMUM MEASURE				.00	.00	100.0	100.0
239	0	10	-3.62	1.86	MINIMUM MEASURE				.00	.00	100.0	100.0
245	0	10	-3.62	1.86	MINIMUM MEASURE				.00	.00	100.0	100.0
270	0	10	-3.62	1.86	MINIMUM MEASURE				.00	.00	100.0	100.0
271	0	10	-3.62	1.86	MINIMUM MEASURE				.00	.00	100.0	100.0
295	0	10	-3.62	1.86	MINIMUM MEASURE				.00	.00	100.0	100.0
MEAN	2.7	10.0	-1.27	.89	.99	.11	1.01	.11			75.2	74.0
S.D.	1.7	.0	1.10	.34	.16	.61	.36	.71			12.7	9.6

Figure 17: Measure order

The variable map showed that the students had the greatest difficulty in solving item S8. This question was related to dengue fever. It provided experimental data on how the pH level of water is related to mosquito volume. The students' failure to incorrectly answer the question indicates their lack of knowledge on or even interest in solving the dengue problem. The students, meanwhile, found item S10 easy to answer. They were asked to interpret a chart and make a prediction based on the information it showed. This indicated that most students can interpret data shown in a chart. Items S2 and S5 had the same level of difficulty. One of them need to be eliminated or improved to better gauge the students' ability.

The students were ranked according to their ability, from the most to least able. Based on the data, only one student (+2.32) had a high STEM problem-solving ability while 29 students did not. The STEM problems used were contextual in nature, which means they affected the students' daily lives. The test results showed that the students still lacked the ability to apply what they learn in real life. They lacked HOTS.

Conclusion

The study revealed that the students still lacked the ability to solve STEM problems. The Rasch model was used to analyse the students' answers to 10 multiple-choice questions related to STEM education. The resulting variable map showed that most of the students had very poor STEM problem-solving ability. This could be due to their unfamiliarity with STEM-related concepts and so teachers would do well to educate them on such.

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Role of SEAMEO RECSAM in Inclusive and STEM Education Development

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Abstract

SEAMEO RECSAM is committed to developing science and mathematics education in the ASEAN community. The centre constantly monitors the latest developments in STEM education and conducts 21st-century learning skills training workshops. This helps the centre stay in the front line to pursue the knowledge, skills, and values needed to effectively respond to changing global contexts, particularly with regard to the complexity of the Southeast Asian economic, sociocultural, and political environment, and develop teachers imbibed with the ASEAN ideals to live in a harmonious community. To meet the challenges of the future, much of the centre's training programmes focus on improving humans' basic character, developing creative human capital with critical-thinking and problem-solving skills, and enriching the ASEAN community's science and mathematics knowledge. Its latest endeavour emphasises STEM education to bring about awareness and enhance the workforce to further economic sustainability and improve the well-being of the society at large. The centre has embarked on various initiatives to develop teachers' and students' skills and interest in STEM. The centre also conducts training, research and development (R&D) efforts, international conferences, seminars, and congresses while serving as an information centre that disseminates state-of the art practices in inclusive education.

Introduction

Since its inception in 1967, SEAMEO RECSAM has been assisting ASEAN countries in major development efforts to improve educational manpower for the advancement of science and mathematics education in the primary- and secondary-school levels. As such, the centre has been continuously offering full scholarships to teachers and educators in the region to improve their skills and help them better adapt to the changing educational environment.

The centre contributes to improving science and mathematics education through various programmes and activities, including training, R&D efforts, international conferences, seminars, and congresses. It also serve as an information centre and clearinghouse to the whole Southeast Asian region. To ensure the relevance of its activities, the centre's programmes are formulated in consultation with senior education representatives from SEAMEO member countries and experts from associate and affiliate countries. SEAMEO RECSAM has made significant strides to date and is now in the process of completing its "10th Five-Year Plan for 2015–2020."

SEAMEO RECSAM envisions to be the leading centre for quality science and mathematics education. It fulfills its mission by:

- Designing and implementing high-quality professional development programmes

- Conducting R&D activities to inform stakeholders about pedagogies and policies

- Convening international conferences, seminars, and workshops to pool experts in science and mathematics education

- Serving as a clearinghouse for information on science and mathematics education in the region

The centre also maintains alignment with current trends in science and mathematics education as shown in the following time line:

- **1990s:** Action research, cooperative learning, problem solving, inquiry-based learning, higher-order thinking, abacus, misconceptions in mathematics

- **2000s:** Lesson study, ICT, smart school, performance assessment, distance learning

- **2010s:** Lesson study, assessment related to TIMSS and PISA outcomes, HOTS, entrepreneurship, project-based learning, problem-based learning, inquiry-based learning

- **Current engagement:** 21st-century skills, STEM education, HOTS, PISA, TIMSS, teaching mathematics through problem solving, lesson study, inquiry-based learning

Role of SEAMEO RECSAM in Supporting and Contributing to the Southeast Asian Community

The ASEAN Community in 2015 was characterised as a political-security, an economic, and a sociocultural community. It was formed to improve the lives of the people in the region, reflected by economic and cultural development, social progress, peace and security, collaboration, mutual assistance in training and research, improved living standards, the promotion of Southeast Asian studies, and cooperation. SEAMEO RECSAM, as a regional centre, can indirectly help by turning teachers and educators into human capital with the following attributes:

- Resilient in facing future challenges

- Well-equipped with 21st-century skills and competencies (OECD, 2009)

- Can cultivate sustainability-related values and attitudes

- Competent and well-versed in languages and ICT tools to convey ideas and thoughts

- Act autonomously based on rational decisions

- Have the ability to interact well with others in the community

- Can acquire knowledge, skills, and jobs while staying competitive

- Responsible and contribute to the society

Hence, the centre's course of actions has been focusing on two significant areas—promoting inclusive education to the community and promoting STEM education to stay abreast of the current trends in and needs of the society.

Promoting Inclusive Education in Communities

SEAMEO RECSAM conducts the following programmes to promote inclusive education within the ASEAN community.

Professional Development Programmes

These programmes cater to in-service teachers from ASEAN countries. They aim to:

- Emphasise ideas and practices that support teachers who include students with diverse needs in the classroom

- Apply appropriate teaching and learning strategies to develop individual strengths with high and appropriate expectations for each child

- Support students through good inclusive practices such as collaboration, teamwork, innovative instructional practices, peer strategies, and others

- Encourage collaboration and communication to deliver and share ideas for better understanding and improvement

- Value diverse communities in most ASEAN societies (Community-building starts in school where all students learn to live alongside peers. They learn together, play together, and grow and are nurtured together.)

- Design mathematics and science courses to raise awareness of the role of ASEAN educators in developing the future generation so they are well-equipped with the necessary knowledge, skills, and values to help build the ASEAN community

SEA-BES Project

The SEA-BES Project is a regional curriculum initiative that aims to develop common, shared, and agreed-upon standards for what every ASEAN learner should know, be able to do, and value in science and mathematics. The centre believes that the CCRLS in Science and Mathematics can be used to improve the quality of SEAMEO member countries' national curricula by creating equity in provision and increasing learning expectations for all students so they can productively contribute to their individual countries and the region. The CCRLS in Science and Mathematics aims to provide world-class learning standards in science and mathematics, including 21st-century skills, that can be used as benchmark in SEAMEO member countries to ensure that all students have access to fundamental knowledge, skills, and values to become socially responsible, globally competitive, and sustainable.

The project is made possible by the active participation and involvement of experts and educators across Southeast Asia and beyond. CRICED of the University of Tsukuba has taken a lead role in linking and extending collaborations with others to produce SEA-BES. CRICED has also been continuing its support for producing a mathematics learning standards guidebook based on the CCRLS in Science and Mathematics. We hope to emphasise development in three components— inculcating values, attitudes, and other positive human characteristics; promoting mathematical-thinking and scientific processes; and acquiring fluency in the subject matter. These components are interconnected and competence in them can be developed in classroom activities based on appropriate contexts.

Promoting STEM Education through STEM- and SDGs-Related Projects

The centre has embarked on the following programmes to promote STEM education through STEM and SDGs-related projects.

SSYS

The Search for SEAMEO Young Scientists (SSYS) is a regional platform where young scientists from Southeast Asia and beyond gather to share and disseminate information on their scientific and mathematical research projects. Since its inception in 1997, SSYS has been held once every two years with a specific theme where students are encouraged to apply their scientific and mathematical knowledge to solve technological problems in order to address sustainability. The theme of the biennial project has always focused on sustainable development as shown in Table 12.

Table 12: SSYS Themes	
Year	**Theme**
2018	Youth Creativity for Harmonising the SDGs
2016	Youth Innovation for Sustainability

Table 12: SSYS Themes	
Year	**Theme**
2014	Disaster Risk Reduction (DRR) for Sustainable Development
2012	Beyond 2012: Greening the Environment for a Sustainable Future
2010	Sustainable Solutions for the Local Community

The three basic elements of sustainable development are ecological, economic, and sociocultural sustainability as outlined in the "2030 Agenda for Sustainable Development." These three aspects must be well-blended to promote ecological balance and improve the quality of human life. These concerns imply a change in learning. SSYS aims to raise the awareness of the youth about their role and responsibility towards attaining sustainable development for their local community. The knowledge and skills they will acquire and develop will give them confidence to pursue endeavours related to sustainable development.

CoSMEd

The International Conference on Science and Mathematics Education (CoSMEd) is a platform that brings educators and researchers together to discuss and address issues in 21st-century science and mathematics education. For instance, the themes and strands of the Sixth and Seventh CoSMEds shown in Table 13 were mostly related to improving awareness of STEM education to contribute to achieving the SDGs.

Table 13: Information on the Sixth and Seventh CoSMEds		
Details	**Sixth CoSMED 2015**	**Seventh CoSMED 2017**
Date	16–19 November 2015	13–17 November 2017
Theme	Revitalising Science and Mathematics Teaching and Learning Culture towards Sustainable Living	Humanising STEM Education to Achieve the SDGs in the 21st Century
Strands	• Teaching and Learning Practices • Pedagogical Innovations • Teachers' Professional Development • Assessment and Evaluation • STEM Education Across Contexts • Equity and Equality	• 21st-Century Teaching and Learning Innovations • Continuous Professional Development • Curriculum and Assessment • Humanising STEM Education and Career Development • Science and Mathematics Education for Special-Needs Students

STEM Education Initiatives

SEAMEO RECSAM plays a significant role in promoting STEM education through research projects and training teachers and educators from SEAMEO member countries. From our perspective, STEM education is an approach to teaching and learning that integrates the content and skills related to STEM. Students are actively engaged in inquiry, exploration, problem solving, creative and critical thinking, logical reasoning, collaboration, and investigation and creating models; artifacts; and relevant, authentic, meaningful, and useful projects. In view of this, the centre undertakes various initiatives as STEM education holds particular importance and relevance in forging sustainable development. As UNESCO Director-General Koïchiro Matsuura stated, "Education—in all its forms and at all levels—is not only an end, but is also one of the most powerful instruments we have for bringing about the changes required to achieve sustainable development" (UNESCO, 2005).

To date, the centre has spearheaded the following initiatives:

- Workshop on Enhancing Science and Mathematics Teachers' Pedagogical Content Knowledge on STEM Education (20–22 January 2015) by Associate Professor Tairo Nomura, Saitama University, Japan, in collaboration with the SEAMEO Secretariat and MEXT, Japan

- Workshop on Differentiated Instruction and STEM: Enhancing Mathematical Thinking (9–10 March 2015) by Professor Beverly Ferrucci, Keene State College, U.S.

- Workshop on Early STEM (19–20 September 2015) by Mr. Hideo Nakano, SEAMEO RECSAM Specialist for Educators of the Institute of Childhood Education Studies and Community Education (CECE), Kuala Lumpur, Malaysia

- Promoting STEM Education through Corporate Social Responsibility (CSR) Programmes (14 May 2016) by a SEAMEO RECSAM specialist in the local community

- SEAMEO RECSAM also partnered and collaborated with the Ministry of Education (MoE) in Malaysia and local universities for the following:

  ◉ Research on STEM education that aims to test teachers' self-perceived readiness to integrate STEM into their teaching and learning practices and determine the demographic factors that influence their self-perceived readiness to integrate STEM in teaching and learning

  ◉ Implementation of STEM education through seminars such as "STEM Education for 21st-Century Skills: Brightening Awareness of STEM Education as Part of the National Agenda" (14–15 May 2015) by Professor Dr. Lynn D. Dierking, Oregon State University, U.S. and primary and secondary education experts from Malaysia and "Enhancing STEM Thinking to Meet the Challenges of the 21st Century, Including TIMSS and PISA" (20 May 2015) for the principals of secondary schools in the Gombak District in Selangor, Malaysia

STEM Education Developments

SEAMEO RECSAM also embarked on the following to promote STEM education in the region:

- **Malaysia-UNESCO International Bureau of Education (IBE) Needs Assessment Workshop (18–20 January 2016) for Strengthening STEM Curricula for Girls in Africa and Asia and the Pacific (Phase 1) under the Malaysia-UNESCO Cooperation Programme (MUCP):** This initiative intends to strengthen STEM curricula for girls focusing on educational content, methods, and structures to foster sustainable development.

- **Capacity Development Workshop (26–30 September 2016) for Strengthening STEM Curricula for Girls in Africa and Asia and the Pacific (Phase 2) under MUCP:** This project seeks to strengthen STEM policies, curricula, and pedagogies in four beneficiary countries from Africa—Nigeria and Kenya—and Asia and the Pacific—Cambodia and Indonesia—mainly through sharing Malaysian expertise and experiences with regard to the inclusion of women in STEM fields.

- **Workshop on enhancing STEM learning in secondary-level mathematics and science classrooms for 500 Malaysian teachers (five batches with 100 teachers per batch in 2017) organised by the Teacher Education Division of MoE, Malaysia and conducted by specialists from SEAMEO RECSAM:** This primarily aims to provide teachers with the necessary knowledge and skills in conducting STEM classes.

- **Workshop on STEM using low-cost materials for secondary-level science and mathematics teachers and educators and lecturers of teacher education institutions (TEIs):** This aims to introduce participants to effective hands-on activities using low-cost educational materials for making teaching aids to improve STEM teaching and learning.

- **Colloquium on Challenges and Opportunities for Implementing STEM Education: Perspectives from the U.S. (28 October 2016):** This was conducted at SEAMEO RECSAM by Dr. Margaret Chmiel from the Smithsonian Science Education Centre.

- **Workshop on Fostering Imagination and Critical Thinking in the Engineering Design Process: A Challenge to STEM Education (6–8 February 2018) by Dr. Tairo Nomura, Director, STEM Education Research Centre and Associate Professor, Faculty of Education, Saitama University, Japan:** This was conducted in collaboration with MEXT, Japan and the SEAMEO Secretariat.

- Promotion of STEM education through competitions such as the Penang Science Olympiad 2016 (27 August 2016) and the STEM Study Contest (23 September 2017), which aim to:

  - Develop confidence in using technology to enhance students' problem-solving skills, imagination, and critical thinking in STEM lessons

  - Develop skills required in the engineering design process and model and product development through practical work and hands-on activities

  - Provide a platform for project- and problem-based learning using STEM approaches to solve real-life issues

  - Promote collaborative learning using real-life problems that can be integrated with STEM knowledge and skills

⊙ Raise awareness on the relevance of classroom learning in STEM fields and skills needed in the job market

⊙ Serve as a learning forum for the exchange of new ideas, knowledge, and valuable experiences amongst students and teachers

Why STEM Education?

In the 21st century, scientific and technological innovations have become increasingly important as we face the challenges of both globalisation and becoming a knowledge-based economy. To succeed in this new information-based and highly technological society, students need to develop capabilities in STEM to levels much beyond those considered acceptable in the past (National Academies of Science, et al., 2007). STEM is multidiscipline-based and so incorporates the integration of other disciplinary knowledge into a new whole. STEM education refers to a process for teaching and learning that offers students opportunities to make sense of the world and take charge of their learning or, in short, obtain meaningful learning. In a STEM environment, students engage in real-world problems and experiences through context-, problem-, project-, and inquiry-based learning activities so they can develop HOTS. The role of STEM education cannot be underestimated in preparing students for future challenges. Innovation is the key to economic growth and STEM education is the key driver of innovation. STEM education provides the foundation for students to acquire further skills as they make their lifetime transitions into the labour market.

The Way Forward

At the core of meeting the needs of the ASEAN community is making sure that teachers and educators stay abreast of educational developments around the world. The "SEAMEO Agenda" calls for educational reforms to promote well-balanced regional development that augurs well with the prominence of STEM education in the 21st century. As a training institution, SEAMEO RECSAM needs to build its skills, capacities, and resources to participate in the delivery and achievement of the 17 SDGs that aim to end poverty, protect the planet, and ensure prosperity for all (UN, 2015). Hence, well-designed projects and courses need to be developed and implemented to ensure success. The centre also hopes to enhance the awareness of and develop responsible citizens to play their respective roles in schools and institutions.

Conclusion

SEAMEO RECSAM believes that education is essential in attain sustainability and so has been promoting comprehensive cooperation for inclusive development amongst the SEAMEO member countries. It has been striving to improve the quality of science and mathematics education in the region and beyond through its various programmes and activities. Keeping future challenges in mind, much of the centre's training programmes focus on improving one's basic human character, developing creative human capital with critical-thinking and problem-solving skills, and enriching the science and mathematics knowledge of the community. As such, it has embarked on various initiatives to develop teachers' and students' skills and interest in STEM teaching and learning, as STEM education will play a vital role in bringing about a workforce that will affect the sustainability of the economic development and well-being of the society at large.

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Lifelong Learning and GCED: The Perfect Combination for Future Global Citizens

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Abstract

In an era when the horizon has widened and country borders have blurred, global citizenship is a much-mentioned phrase. However, becoming a global citizen requires not only great courage to explore the world, but also a knowledge-rich mind and consummate skills, along with the willingness to learn lifelong, as we all encounter new issues in the ever-changing world. In this regard, lifelong learning will play an important role in equipping future international residents with the necessary skills and knowledge. This article aims to present an overview of GCED and lifelong learning and their roles in today's world and how they can be combined to make every person a truly global citizen.

Introduction

Although the concept of global citizenship has been existent for several millennia, it has only now increasingly been used in daily life despite contentions with regard to its definition. In fact, a widely agreed-upon definition of global citizenship has yet to be developed. Some claim global citizenship refers to "citizenship beyond borders" or "citizenship beyond a nation-state." Others noted that "cosmopolitanism" as a term may be broader in scope and thus more inclusive than global citizenship. Still others opt to use "planetary citizenship," which focuses on the global community's responsibility to preserve Earth. In all cases, however, global citizenship does not entail legal status. It refers more to a sense of belonging to the global community and common humanity, with its members presumably expressing solidarity and having a collective identity and sense of responsibility at the global level. Global citizenship can be seen as a metaphor rather than a formal membership. As a psychosocial framework for collectiveness, global citizenship can and is expected to generate actions and engagement amongst, and for, its members through civic actions in the public domain to promote a better world and future. And it is necessarily based on and respects the universal values of human rights, democracy, justice, non-discrimination, diversity, and sustainability, amongst others.

Global citizenship is one of the most important consequences of today's more open and borderless world. Dramatic advances in ICT allow people to connect and interact with one another from anywhere and at any time. This has contributed to the intensified perception and reality of being interconnected and living beyond local perimeters, even if it only happens virtually. People have also become more interdependent. Participation in sub-regional, regional, and international governance bodies and structures in all sectors, including private enterprises and social organisations, has created new stakeholders that reach beyond national borders who are required to think and act globally and locally at the same time. Moreover, increased trans-national migration is making communities inevitably more heterogeneous or "globalised," making the necessity of learning to live together more acute. The expansion of democracy to a global level has led to the accompanying citizen demand for civic and other rights at the national level.

On the other hand, this also entailed tensions and conflicts amongst populations that have resulted from and result in effects beyond national boundaries. Challenges such as sustainable development, including climate change, are demonstrating the need for cooperation and collaboration far beyond national boundaries. Continuing global challenges call for collective action at the global and local levels.

To effectively handle social, political, cultural, and global issues, global citizens must thus be equipped with relevant values, attitudes, and communication skills to complement their cognitive knowledge and skills so they can support peace, human rights, equity, acceptance of diversity, and sustainable development, also known as the missions of GCED.

Figure 18: Overview of GCED (adapted from UNESCO, 2015)

GCED

GCED is recognised in many countries as a strategy to help children and the youth prosper in their personal and professional lives and contribute to building a better world. It aims to empower learners to engage and assume an active role, both locally and globally, in facing and resolving global challenges so they can ultimately become proactive contributors to a more just, peaceful, tolerant, inclusive, secure, and sustainable world. GCED is transformative, as it provides learners the opportunity and competencies to realise their rights and obligations to promote a better world and future. It draws upon learning from other transformative education processes, including human rights education, ESD, education for international or inter-cultural understanding, and education for peace.

GCED is playing an increasingly important role and has been recognised by the UN and mentioned in various conventions. It has been included as one of the three priorities of the Global Education First Initiative (GEFI), which was launched in 2012 by the UN Secretary-General.

> *The world faces global challenges, which require global solutions. These interconnected global challenges call for far-reaching changes in how we think and act for the dignity of fellow human beings… Education must be transformative and bring shared values to life. It must cultivate an active care for the world and for those with whom we share it… Technological solutions, political regulations, or financial instruments alone cannot achieve sustainable development. It requires transforming the way people think and act. Education must fully assume its central role in helping people to forge more just, peaceful, tolerant, and inclusive societies. It must give people the understanding, skills, and values they need to cooperate in resolving the interconnected challenges of the 21st century.*

In 2015, the role of GCED was specified in target 4.7 of the SDGs:

> *By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, amongst others, through ESD and sustainable lifestyles, human rights, gender equality, the promotion of a culture of peace and nonviolence, global citizenship, and appreciation of cultural diversity and of culture's contribution to sustainable development.*

Within UNESCO, the "Incheon Declaration for Education 2030" states that:

> *The knowledge, skills, values, and attitudes required by citizens to lead productive lives, make informed decisions, and assume active roles locally and globally in facing and resolving global challenges can be acquired through ESD and GCED, which includes peace and human rights education as well as inter-cultural education and EIU.*

In 2017, the Learning Metrics Task Force released "Measuring GCED: A Collection of Practices and Tools" to specifically define what is required to turn young people into "citizens of the world," including competencies and learning objectives (see Figures 19–21).

Figure 19: Cognitive GCED objectives (adapted from Centre for Universal Education at Brookings, 2017)

Figure 20: Socio-emotional GCED objectives (adapted from Centre for Universal Education at Brookings, 2017)

Figure 21: Behavioural GCED objectives (adapted from Centre for Universal Education at Brookings, 2017)

Lifelong Learning

Lifelong learning, in its simplest form, refers to learning lifelong or learning "from cradle to grave." This puts emphasis on the duration and continuity of the learning process in an individual's life as well as the idea that learning can occur beyond the formal structure within an educational institution. As defined by UNESCO in 1984, lifelong learning refers to "all learning activities undertaken throughout life with the aim of improving knowledge, skills, and/or qualifications for personal, social, and/or professional reasons." Although this is quite simple and self-explanatory, lifelong learning is meant to highlight the basic human right to education throughout life, regardless of one's background, gender, or age. Furthermore, owing to the diverse living and educational backgrounds of people all over the world, lifelong learning also underlines diversity in terms of approach, as learning can happen in formal, informal, and non-formal settings.

The important role of lifelong learning is now being recognised in global education policies, most obviously by SDG 4.7—"Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all." It was also reiterated by the "Incheon Declaration for Education 2030" in 2015.

The reasons as to why lifelong learning is important stem from the benefits it provides to learners. According to the Benefits of Lifelong Learning (BeLL) Project in 2013–2014, the benefits of lifelong learning include:

- Expanding one's social network

- Ensuring mental well-being

- Promoting self-efficacy

- Giving one a sense of purpose in life

- Changing one's educational experiences

- Providing work-related benefits

- Improving skills and competencies

- Providing a locus of control

- Enriching trust

- Improving physical health or encouraging healthy behaviour

- Improving one's tolerance

- Enhancing civic and social engagement or civic competence

- Providing family-related benefits

From the above, the essential role of GCED and lifelong learning in attaining SDG 4 can be obviously understood. It is also apparent that the two concepts are good companions.

Conclusion

GCED is built on a lifelong learning perspective and lifelong learning is crucial for all forms of GCED. Characterised as flexible and inclusive, lifelong learning can meet GCED's holistic requirements of "formal and informal approaches, curricular and extracurricular interventions, and conventional and unconventional pathways to participation" (UNESCO, 2014).

As everyone in the world has a right to know, do, be, and live together, GCED is not only for children and the youth, but also for adults and elders. Besides, many pedagogical approaches and techniques have been suggested and applied to support GCED such as dialogic, inquiry-based, cooperative, and engaged learning to suit the diversity of learners' interests and needs. Formally, GCED can be delivered as an integral part of an existing subject (such as ethics or citizenship education, social studies, environmental studies, geography, or culture) or an independent subject that provides insights into the concept itself from an interdisciplinary approach. Informal and non-formal learning have a great potential to boost the practice of GCED as well. In these settings, flexible and variable pedagogical approaches can be used to target populations outside the formal system and those who are likely to use new ICT tools and social media. An integrated approach is an important element that can provide opportunities for sustained engagement across the curriculum as well.

In sum, GCED and lifelong learning are closely related and mutually complementary. Their successful combination is expected to play a central role in building the capacity of modern humans to meet the needs of a modern world—ones with a wide range of knowledge, great skills, and deep passion to never stop using their abilities to strive for the betterment of the world.

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How SEAMEO CHAT Adds Value to Education and Helps Foster Global Citizenship

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Abstract

SEAMEO CHAT is one of the 26 specialist centres of SEAMEO, established in 2000. As a regional SEAMEO centre, it aims to promote cooperation in the study of history and tradition amongst member countries and develop a better identity through research, HR development, education, and public awareness programmes. These days, the centre finds ways to add value to education to help realise global citizenship.

History is a branch of study that deals with human beings—their behaviour, growth and development, relationships, resources, and the various institutions they require to function and carry on living smoothly. Families, schools, workplaces, governments, and recreational activities are aspects of life are interrelated and interdependent. So, whether one wants to become a doctor or an engineer, we all have to live in a common society, interact with individuals who have different cultural and socioeconomic backgrounds, adapt to various situations and circumstances, and adhere to certain societal norms to lead peaceful and productive lives.

History also helps students become aware of their environment and teach them about the various civilisations, movements, and renaissances that have occurred over the years. This knowledge enables them to understand how the world and different societies have evolved, the important events that occurred in the past, and enduring ideas and eminent personalities that had an impact and affected the lives of people both locally and globally. It also helps them understand how different societies are structured, managed, and governed. This, in turn, helps them understand their place in the world. The centre thus strives to incorporate history into school curricula to ensure the well-rounded education of global citizens. This article discusses how teaching history can add value to education and lead to fostering global citizenship in the so-called "digital generation."

Introduction

Education is defined as the process of facilitating learning or the acquisition of knowledge, skills, values, beliefs, and habits. It refers to helping people to learn how to do things and encouraging them to think. It provides individuals an opportunity to improve their lives, become successful members of their communities, and actively contribute to national socioeconomic development. It is traditionally valued as a key determinant of social mobility.

What Is Global Citizenship?

A global citizen is one who is aware of and understand the wider world and his or her place in it. He or she takes an active role in the community and work with others to make our planet more equal, fairer, and more sustainable. For SEAMEO CHAT, global citizenship is all about encouraging young people to develop the knowledge, skills, and values they need to engage with the world. We believe that we can all make a difference.

What Is History?

History refers to a continuous, systematic narrative of past events as they relate to a particular people, country, period, or person, usually written as a chronological account. It simply represents a basic sense or knowledge of the past. In earlier times, a sense of history encompassed both an imaginative story of events and a narrative of chronological past events.

For historians, various modern systemisations and interpretations of this continuous and connected process then become history in a new general and increasingly abstract sense. Moreover, in view of the prevailing new stress on the workings of history as human self-development, history in many of its wider uses shed its exclusive association with knowledge of the past and became directly connected not only to the present, but also to the future (Nasson, n.d.).

Does History Add Value to Education and Help Foster Global Citizenship?

History provides valuable information and perspectives embedded within a powerful analytical mode, which can be especially useful in a rapidly changing world. It helps students become better-prepared citizens of the society, capable of making informed choices about current issues and able to follow events. Looking at today's digital generation and history as a subject in a rapidly changing world, we see lack of interest in history and other art-related subjects.

Education for global citizenship should not be taught as an additional subject. Instead, it should be treated as a framework for learning, reaching beyond school to encompass the wider community. It can be promoted in class through the existing curriculum or new initiatives and activities. Its benefits should be felt in school and beyond. Global citizenship helps young people build their own understanding of world events; think about their values and what is important to them; take their learning in the real world; challenge their ignorance and intolerance; get involved in the local, international, and global communities; develop arguments and voice opinions; and see that they have the power to act and influence the world around them. Global citizenship should inspire teachers and parents, too. The young generation should have a voice. The world may be changing fast, but they can still make positive differences and help build a fairer, safer, and more secure world for everyone.

SEAMEO CHAT finds ways to help students become better global citizens and add value to education. It has long ago realised that social science subjects such as history can help students become good global citizens and that teaching the subject using a well-organised curriculum can add value to education. It believes that curricula need to be changed to achieve this, however, and so has been supporting the governments of member countries as a curriculum planner.

Teaching political ideologies, constitutional laws, citizenship, rights and duties, morals and virtues, and social codes of conduct enables students to become aware of their roles and responsibilities, particularly in relation to social and civic affairs. By providing relevant information and knowledge, skills, and attitudes, the study of history prepares students to grow into active, responsible, and effective members of the society. It also teaches them to address societal and global concerns using literature, technology, and other identifiable community resources. Furthermore, learning about different religions, social and cultural beliefs, castes and creeds, nationalities and ethnicities, values, languages, festivals, food and clothing, types of families, and so on increases their awareness that the society they live in is diverse and multicultural and yet is interdependent and interrelated. History helps students recognise the benefits and challenges of living in a world with multiple cultures and ideologies. This awareness helps them understand the importance of democracy, rights and freedoms, and the fact to live and coexist peacefully, each and everyone needs to respect, trust, and balance the various opinions, values, and attitudes, lifestyles, cultures and practices, and ideologies that exist in society.

In secondary school, students are taught a variety of subjects that are supposed to guide them in their future careers and personal choices. History is one of these subjects. Tackling the curricula and teaching methods used will be of some kind of help in promoting history, that is not very interesting for students.

Bearing this in mind, SEAMEO CHAT conducted a workshop on 15–16 December 2016. Two resource persons led the workshop—one from the Philippines who has taken part in history curriculum planning and providing guidance to secondary teachers on effective teaching and the other from Myanmar who has taken part in drawing guidelines for history teachers in the lower-secondary level. Some 24 participants—curriculum specialists and secondary-level history teachers from Cambodia, Lao People's Democratic Republic (PDR), the Philippines, Singapore, Thailand, and Myanmar—attended the workshop. Eight of the participants were teacher-trainers from Southeast Asian countries while 16 came from the Teacher Education and Curriculum Planning Departments under MoE Myanmar. The outcome resulted in very effective ways of teaching history in lower-secondary schools in Southeast Asia. The centre submitted its report for MoE use afterwards.

IT tools and devices have become ubiquitous parts of our lives, especially for the young generation. We can even say that today's generation is the "digital generation." In a rapidly changing world, things change fast. An event that happens today can be considered historical in a span of seconds. This is pushing SEAMEO CHAT to consider changing the approach to teaching history. Learning history should be fascinating and exciting. It can, however, be dry and boring if not done the right way.

As history provides valuable information and perspectives embedded within a powerful analytical mode, which can be especially useful in a rapidly changing world, SEAMEO CHAT believes that history will also make students better-prepared citizens of the society, capable of making informed choices about current issues and able to follow events. To address current needs, the centre is currently planning to conduct a workshop with the theme, "History in the Eyes of the Digital Generation," in collaboration with other centres, specifically SEAMOLEC.

Because learning history is important though considered boring by the digital generation, there is a need for more innovative and creative methods for teaching the subject. The workshop will pave the way for history teachers to apply digital technologies in research, writing, and teaching to encourage and assist them to think critically about the way historical and other cultural knowledge is constructed; develop ways to more efficiently find and evaluate information online while analysing and making sense of such findings; offer practical advice to teachers on how to make best use of IT in teaching history and find new ways of thinking about pedagogy in digital humanities; and develop a common concept of preparing history lessons so these are more attractive and better achieve desired end results. The workshop has been set to occur two days in October 2019 at the SEAMEO CHAT office.

The workshop should enhance knowledge and practices on teaching and learning history using information technology (IT) tools and devices. It will be aligned with Priority 5 of the "SEAMEO Education Agenda." It will also promote inter-centre cooperation as well in terms of sharing knowledge and expertise. It can also contribute to the policy planning of the curriculum division of the education ministries of member countries. SEAMEO CHAT plans to invite historians, IT specialists, curriculum planners, and history teachers from SEAMEO member countries. It will also request that SEAMOLEC send IT and pedagogy experts.

Tasked to promote the culture and traditions of the various countries in the region, SEAMEO CHAT will also host an impromptu talk competition in commemoration of its 18th anniversary. This aims to stimulate students' interest in history; make them realise the importance and value of learning history; encourage them to learn history using digital technologies; and introduce history teaching using digital technologies. It aims to generate renewed interested in history.

The competition will be split into two sessions—a preliminary competition and a final competition. Competitors from different universities and institutions will be invited through newspaper ads and calls for entry on the SEAMEO CHAT website. They will be tested in terms of English language proficiency and historical facts in the preliminary round by officials from SEAMEO CHAT and the Departments of History and English of the Yangon University, the National Centre of English Language, and the Yangon University of Foreign Languages. Those who will pass the preliminary screening will move on to compete in the final round.

Conclusion

The aforementioned activities of SEAMEO CHAT support, educate, and encourage the youth to increase their awareness and understanding of the wider world while helping them develop their critical-thinking abilities and comprehension, application, analysis, evaluation, and synthesis skills and creativity to become global citizens.

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