

Establishing the Core Concepts and Competence Indicators of Global/International Education for Taiwan's Grade 1–9 Curriculum Guidelines

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Abstract The development of standards, or indicators, for global/international education has lagged behind that of the national curriculum. To address this, we developed a set of core concepts and competence indicators of global/international education for Taiwan's *Grade 1–9 Curriculum Guidelines* and revised these through three rounds of Delphi surveys. The final version is composed of five core concepts, three dimensions, and 60 competence indicators across seven learning areas accessed through four learning stages. To explore the extent to which the national curriculum overlaps with global/international education, we conducted content analysis to examine the global/international components of the guidelines. This revealed that 10.70 % of the competence indicators in the guidelines were related to global core concepts. Numerous indicators were related to multiculturalism, whereas only a few were related to human rights and social justice. The comparison of the indicators for learning areas showed that integrative activities indicators were the most closely related to global education, whereas social studies indicators were related to all global core concepts. The mathematics indicators were

unintegrated with global core concepts, with most of the learning areas emphasizing only one or two such concepts.

Keywords National curriculum · Global education · International education · Competence indicators · Delphi technique · Content analysis

Introduction

Global education is an international movement (Tye 2003) driven by increasingly globalized interactions in contemporary society. Given this backdrop, a crucial educational requirement is to provide learners with opportunities and competencies to reflect on, and share their perspectives, within a globally interconnected society (Global Education Guidelines Working Group 2010). Many countries and international nongovernment organizations (NGOs) recognize global education as one of the most important educational components, and promote corresponding policies. Following international trends, Taiwan's Ministry of Education (MOE) published the *White Paper on International Education for Primary and Secondary School* in 2011. Despite the progress made in this field, proposed educational policies and curriculum development schemes remain in their infancy, so it is difficult to conduct assessments of their implementation (Mundy et al. 2007). Therefore, undeveloped concepts are used to assess progress (Betts 2004). Lewis (2005) stated that if schools are to cultivate global citizens, they should develop standards and benchmarks that reflect an international perspective. Standards for national education exist in many countries, but little attention has been paid to the development of standards for international education (Oden 2007, p. 179). To address this gap, we aimed to develop a set of core

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concepts and competence indicators for global education in Taiwan.

Some countries have declared that, in a globalized, interdependent world, their educational aims are reflected in the national curricula (Commonwealth of Australia 2008; Department for Education and Skills 2005). Nevertheless, many important global issues remain neglected or inadequately addressed. Although numerous global educators have highlighted the relevance of global education to all curricular areas (Oxford Committee for Famine Relief 2006), little empirical evidence exists to support its importance. This knowledge gap raises questions regarding the extent to which components of global education are reflected in national curricula. Therefore, our second aim was to examine the extent to which global core concepts are reflected in Taiwan's *Grade 1–9 Curriculum Guidelines* (MOE 2011a). It is anticipated that the results will increase the knowledge of educators interested in working with standards and benchmarks, so as to frame discussions of external comparison and internal improvement of global education (Oden 2007).

Theoretical Framework

We investigated the evolution of global education, highlighting the way in which a variety of curricular movements have been launched from this platform. The core concepts of global education were then analyzed on the basis of official global education documents recently released by different countries, international institutions, and NGOs. The analytical results were used as bases for building a framework for establishing the core concepts and competence indicators for global education in Taiwan.

Global education is an umbrella term for the pedagogical concepts related to the realities of today's globalized world. It has developed gradually, and remains an open, ongoing, multidimensional, concept of contemporary general education (Global Education Guidelines Working Group 2010).

At the end of World War II, the teaching of international issues was incorporated into the policies of several United Nations (UN) organizations to foster world peace through international understanding (Mundy et al. 2007). However, this initiative remained relatively unchanged in the years immediately after the war. Public school curricula tended to retain a predominantly national focus, molding children for membership in their respective national societies (Rauner 1998). Cold War tensions reinforced these traditional nationalistic approaches.

Considerable changes began to occur in the 1960s, as international NGOs active in the development of the field expanded their public engagement efforts to foster a wider

understanding of world issues and a commitment to change, especially to the eradication of global poverty and inequality (Commonwealth of Australia 2008; Mundy et al. 2007). Furthermore, progressive educators argued that a number of crucial global issues, such as the environment, world development, peace, and conflict, were missing from formal education. This situation prompted the development of issue-based educational schemes, each with the express interest of creating curricula with a more global thrust (Hicks 2008, 2012). In addition to the UN International Children's Emergency Fund and other UN organizations, NGOs and progressive educators helped to establish the fields of *development education* and *peace education*.

By the early 1980s, global education was a well-established field of curricular inquiry that generated interest and support from teachers' organizations, UN bodies, and international aid agencies. The concept increasingly appeared as a goal or theme in national curricula, and was often modified into *global citizenship education* to amplify the philosophy of active learning and public engagement in creating and recreating a more equal, just, peaceful, and sustainable world, based on solidarity (Hicks 2012; Mundy et al. 2007; Rauner 1998). The Maastricht Global Education Declaration claims that global education encompasses development, human rights, sustainability, peace, conflict prevention, and intercultural education (Europe-Wide Global Education Congress 2002). Global education is also defined as the global dimension of education for citizenship.

A review of the development of global education suggests that certain core orientations are intended to identify common ground among the definitions and scopes of global education. Several official publications from various countries, international organizations, and NGOs highlight the need for a global dimension within school curricula. Table 1 shows several of the identified core concepts of global education.

The documents show two ways in which to develop the elements of global education. The first divides it into knowledge, skills, and attitude dimensions, before developing the collateral concepts in each dimension. The second identifies the related concepts and then develops students' knowledge, skills, and attitudes for each of these. This study has adopted the latter, as this is a more concise manner in which to highlight the trinity of knowledge, skills, and attitudes for each concept than first dividing them collaterally.

In the analysis of the traditions and latest trends of global education, we identified the five most popular core concepts (different sources also express these as learning emphases, realms, themes, categories, etc.): global system, multicultural, social justice and human rights, world peace, and ecological sustainability. Minor popular concepts were

Table 1 Core concepts of global education

Resource	Core concepts
UK: DfES (2005)	The global dimension can be understood through eight core concepts: global citizenship, conflict resolution, diversity, human rights, interdependence, social justice, sustainable development, and values and perceptions
Australia: Commonwealth of Australia (2008)	Five learning emphases reflect recurring themes in global education: interdependence and globalization, identity and cultural diversity, social justice and human rights, peace building and conflict resolution, and sustainable futures For good global citizenship, opportunities should be provided to develop students' values, knowledge, skills, and capacities for action
U.S.: Collins et al. (1998)	The realm of global/international education: global issues, global culture, and global connections. These themes cross all academic disciplines. Among the skills that students can develop are issue analysis, problem solving, interpretation, reasoned persuasion, and research/investigation
Collins et al. (1996)	The ten categories of global/international education are conflict and its control; economic systems; global belief systems; human rights and social justice; planet management: resources, energy, and environment; political systems; population; race and ethnicity; human commonality and diversity; the technocratic revolution; and sustainable development
EU: The Global Education Guidelines Working Group (2010)	The knowledge, skills, values, and attitudes needed for securing a just, sustainable world, where everyone can realize his or her potential: Knowledge Knowledge of the globalization process and the development of a world society; knowledge of the history and philosophy of universal concepts of humanity; knowledge about commonalities and differences Skills Critical thinking and analysis; changing perspectives or adopting a multiperspective approach; recognizing negative stereotypes and prejudices; intercultural competencies in communication; teamwork and cooperation; empathy; dialog; assertiveness; dealing with complexity, contradictions, and uncertainty; dealing with conflicts and conflict transformation; creativity; research; decision-making; dealing with media; dealing with science and modern technology Values and attitudes Self-esteem, self-confidence, self-respect, and respect for others; social responsibility; environmental responsibility; open-mindedness; visionary attitudes; proactive and participatory community membership; solidarity
NGO: Oxfam (2006)	The key elements for developing responsible global citizenship: Knowledge and understanding Social justice and equity; diversity; globalization and interdependence; sustainable development; peace and conflict Skills Critical thinking; ability to argue effectively; ability to challenge injustice and inequalities; respect for people and things; cooperation and conflict resolution Values and attitudes Sense of identity and self-esteem; empathy; commitment to social justice and equity; value and respect for diversity; concern for the environment and commitment to sustainable development; belief that people can make a difference

categorized into related keywords (Table 2). All of the core concepts and keywords were searched to identify all of the related competence indicators in the guidelines, and were then organized, adapted, coordinated, and refined based on the theoretical framework of global education. Under the knowledge, skills, and attitudes dimensions for each core concept, we subsequently developed the first version of core concepts and competence indicators for global/international education. Given that global education is composed of almost the same components as current

international education across different regions, we followed Collins et al. (1996) in using the term “global/international education.”

Global/International Education in Taiwan

Global education has exerted little effect on the Taiwanese educational system and global issues remain relatively unexplored. Instead, Taiwan's educational authorities

Table 2 Core concepts and keywords for global/international education

Core concepts	Keywords
1 Global system	Global, system, earth/planet, world, mutual, interdependent, relation/correlation, connection, international, common
2 Multiculture	Respect, difference, diversity, variation, multicultural, folk, custom, culture, language, sex/gender, race/ethnic, toleration, immigrant/emigrant, aborigine/indigene, acceptance
3 Social justice and human rights	Human rights, justice, fairness/equity, equality, freedom, responsibility, citizen/people, rights and benefits, law
4 World peace	Peace/harmony, cooperation, negotiation, communication, group, organization, solution, war, conflict
5 Ecological sustainability	Ecology, sustainability, survive, environment/circumstances/surrounding, nature, life, resource, future, energy, recycle

emphasize a nationalized curriculum. From 1949 to 1987, Taiwanese people could not freely interact with international society, because the country was placed under martial law. During the post-martial law period, the educational reform movement concentrated on local Taiwanese issues instead of Chinese affairs, and the educational landscape of the country has only recently exhibited changes. To increase the participation and competitiveness of next generation Taiwanese in the global arena, the MOE (2011b) published the *White Paper on International Education for Primary and Secondary School*, promoting the development of internationalized citizens for the twenty first century by encouraging students to understand international society and develop international attitudes. The *White Paper* covers four goals: national identity, international awareness, global competitiveness, and global responsibility.

However, according to the *White Paper* (2011b), the promotion of international education has met with challenges. Few schoolteachers have visited foreign academic institutions; factors such as curriculum infusion, teachers' professional development, and internationalization of school environments have been relatively neglected. The international education programs have been in pilot operation for several years in certain counties, but implementation has been lax. Teachers lack sufficient confidence to develop well-organized curricula. Schools are unsure of their progress, and are deficient in providing international education. Administrative agencies also lack the tools required to evaluate and improve school accountability. In order to resolve these problems, the MOE (2012) published handbooks declaring a system of competence indicators for international education for the reviews of grant

applications and program evaluations of grades 1–12. Recently, an increasing number of schools have participated in school-based international education projects, and have continued to make some progress in implementing global/international education.

However, the MOE's competence indicators for international education deviate from the current national curriculum, *Grade 1–9 Curriculum Guidelines*, which was adopted 2001, and has since been revised several times. The national curriculum is divided into seven learning areas: language arts, mathematics, social studies, science and technology, health and physical education, arts and humanities, and integrative activities. To mold citizens who possess ten core competencies essential for the twenty first century, educational authorities formulated indicators for each learning area to demonstrate continuity and progression from a lower to a higher learning stage. The guidelines also contain global/international components (e.g., one of the core competencies is *cultural learning and international understanding*). Nevertheless, the guidelines emphasize only subject knowledge and competencies in each learning area, and many important global issues remain neglected or inadequately addressed.

Even recent efforts and progress toward international education have obviously revealed some remaining issues worth further contemplation regarding the competence indicators for international education, as released by the MOE. Theoretically, it is difficult to see national identity put in the premier position, while simultaneously emphasizing global competitiveness in the global/international education document reviewed previously. In addition, not all of the core concepts of global/international education emerge equally in the MOE's 29 indicators; nine items mention culture, while peace and sustainable development appears once, and human rights features twice. Moreover, the indicators sometimes do not evenly match the knowledge, skills, and attitudes dimensions for global/international education.

Practically, the MOE's competence indicators for international education do not match those for current curriculum guidelines in a systematic and sustainable manner. They are currently divided into three levels, not necessarily corresponding to the levels of primary school, junior high school, and high school, although schools are permitted to choose any level of competence indicators they please. It is not unusual to see primary schools using the high-level indicators, which makes us wonder who uses the lower level indicators.

Many schools that have attended school-based international education projects have adopted the additive approach of proposing additional short-term lesson plans, rather than the transformative approach of developing a long-term plan to infuse the indicators curriculum-wide,

through different levels across learning areas. Therefore, the unique strength of this study is to make improvements toward resolving the theoretical and practical problems mentioned above.

Methodology

Delphi Technique

The Delphi technique structures the communication process of a group of experts to deal with a complex problem. It aims to elicit information and evaluations from participants to facilitate problem-solving, planning, and decision-making, as well as to create maximum opportunities for the individuals to contribute their knowledge, enabling the mutual development of expertise. In this approach, there is no direct face-to-face interaction between group members. Rather, they are informed of one another's responses in a blinded manner to ensure that their responses are not influenced by group dynamics (van den Heuvel-Panhuizen and Elia 2012; Wen and Shih 2008).

In the present study, three rounds of Delphi surveys were conducted to determine core concepts, keywords, and competence indicators. These were then modified to ensure alignment within the educational context of Taiwan and feasibility of application by Taiwanese teachers and students. The selection criteria for the participants were as follows: (1) scholars who have engaged in global/international education in universities, or who have published related journal papers, and (2) experts who have participated in related policies or programs. A total of 15 participants were invited. The first-round questionnaires were mailed to the participants on March 8, 2012; the second round on April 10, 2012; and the third round on May 18, 2012. All participants completed the three rounds.

To facilitate understanding, the first questionnaire described the purpose of the study, Delphi procedure, and method for answering the questions. The second and third questionnaires described how the data obtained from the previous questionnaire(s) were to be treated; these data included the statistical analysis results, summary, and questionnaire revisions designed to help respondents re-evaluate each criterion. Demographic data included respondent names, genders, universities, and designations. To ensure anonymity, the respondents' personal information remained confidential during the process.

The questionnaire comprised core concepts, keywords, and competence indicators. A five-point Likert scale helped to determine the appropriateness of the questionnaire. A *revised opinion* field was included for participants to provide suggestions or comments.

After data collection, a descriptive analysis was performed to determine means, modes, average means, and standard deviations. An average mean >4.0 and a standard deviation <1.0 indicated consensus on an item, which was omitted from the next round. All of the items in the third questionnaire generated an average mean >4 and a standard deviation <1.0. On this basis, the core concepts and competence indicators were established.

During consensus-building, the questionnaires were revised according to the opinions offered by the participants. In the first round, some indicators were regarded as being difficult for students; thus, they were moved to a higher learning stage. For example, 1-1-1 was moved from stage 1 to stage 2 and modified into 1-2-1. Some words used in the indicators were regarded as being intricate or abstract; thus, these words were simplified or concretized. In the second round, there remained a small quantity of difficult indicators that required revision. It was suggested that we adjust the dimensions of some items and elaborate on the words in the item belonging to the attitudes dimension. In the third round, only five items had slightly modified words.

Content Analysis

To explore the extent to which the elements of global education were reflected in Taiwan's national curriculum, we conducted content analysis on the guidelines of each learning area. The units of analysis were the competence indicators. The competence indicators totaled 1,560 items from all of the learning areas. These were downloaded from the MOE website and processed through Microsoft Office for the keyword search (Table 2). A session was devoted to training three graduate students from an educational institute to code for two training datasets. They coded the datasets together, but independently blind-coded all of the discussion transcripts. They then determined whether the items selected by the software implied the exact meaning of core concepts. Finally, 167 items were confirmed. Scott's (1955) *pi* was used to calculate the inter-coder reliability for each pair coder.

$$pi = \frac{\% \text{ observed agreement} - \% \text{ expected agreement}}{1 - \% \text{ expected agreement}}$$

Then a composite reliability was calculated:

$$\text{Composite reliability} = \frac{N(\text{average intercoder agreement})}{1 + [(N - 1)(\text{average intercoder agreement})]}$$

where *N* is the number of coders.

The calculated composite reliability coefficient was 0.93, showing that our coding team had high consistency.

The frequency of related items was calculated for each learning area and core concept. The sum, percentage, and rank of these frequencies were also calculated.

Results

The Delphi survey results (Table 3) indicate the emergence of five core concepts— global system, multicultural, social justice and human rights, world peace, and ecological sustainability—and 60 competence indicators. Learning was divided into four stages, in accordance with the differentiation and progression observed for Grades 1–9 global/international education. Each core concept covered knowledge, skills, and attitudes dimensions in each learning stage.

The results (Table 4) revealed that 10.70 % of the competence indicators in Taiwan's *Grade 1–9 Curriculum Guidelines* related to global core concepts. Numerous indicators related to the concept of multicultural, whereas few related to human rights and social justice.

Comparison of the learning areas showed that the number of core concepts for the indicators from language arts was marginally greater than for the other areas, but the percentage was lower than most. This was because this area has double the learning hours of the others, and contains the guidelines for Mandarin, English, and three Dialects, while the other areas contain only one guideline; therefore, the number of indicators for language arts collectively occupies almost half of the total learning areas, but the percentage for each individual guideline of this area is low, with the exception of the guideline for English, which showed an average percentage. A total of 44.23 % of the integrative activities indicators were relevant to global education, indicating that this area was the most closely related to the latter. The second most closely related area was social studies, in which 32.19 % of indicators were related to the core concepts. A notable result was that only the social studies indicators revolved around social justice and human rights. In the other learning areas, these core concepts were either completely neglected or related to only one or two indicators. Social studies covered all of the core concepts, while other areas emphasized only one or two core concepts; for example, science and technology indicators focused on global system and ecological sustainability, while the mathematics indicators were unrelated to any core concept.

Discussion

Although global/international education is a worldwide movement, the development of its standards or indicators

continues to lag behind national standards. To bridge this gap, we analyzed the traditions and international trends of global education, as well as the competence indicators in Taiwan's *Grade 1–9 Curriculum Guidelines*. We then developed the first version of the core concepts and competence indicators of global/international education for Taiwan's curriculum. We conducted three Delphi surveys to produce the final version, which was composed of five core concepts, three dimensions, and 60 competence indicators across seven learning areas accessible through four learning stages.

The MOE (2012) of Taiwan states that the national curriculum reflects some components of global and international studies, but the country remains lacking in research highlighting the number of global/international components incorporated in the national curriculum. Therefore, we analyzed the competence indicators of the guidelines, and revealed that 10.70 % were related to the core concepts of global education. It appears that the guidelines broadly mirrored the international trend toward the introduction of global education in Grades 1–9, but with room for improvement, as not all core concepts are equally treated in the guidelines. Multiculture is the most popular concept, with a frequency of over quadruple that of social justice and human rights. Our findings resemble those of Mundy et al. (2007), who explored global education in Canada and found that contemporary social injustice remains limited in elementary schools.

Global education is relevant to all curricular areas (Oxfam 2006); learning sustained across a curriculum is an important means of facilitating students' understanding of global issues and linking learning experiences in different subjects (DfES 2005). The practical situations reflected by our findings, similar to those indicated in recent studies from other countries (Bourn 2012; Gadsby and Bullivant 2010; Hicks and Holden 2007; Mundy et al. 2007), are that, apart from social studies, global themes serve as supplements to core courses. A unique finding was the ranking and percentages of the global core concepts in relation to the learning areas. The results showed that integrative activities, a special learning area in which teachers design learning activities that facilitate student integration of knowledge and skills across areas, were most closely related to global education. Instead of underscoring subject knowledge, these activities emphasize the experience and reflections that students acquire from activities. Why does this learning area contain more global core concepts than others emphasizing subject knowledge? It may be attributed to the argument raised by Pike and Selby (2000) that global education combines two strands of educational thinking and practice: world-mindedness and child-centeredness. These are vital, interrelated components at the core of global education in an interdependent world. An

Table 3 The final version of core concepts and competence indicators

Core concepts	Stage 1 (Grades 1–2)	Stage 2 (Grades 3–4)	Stage 3 (Grades 5–6)	Stage 4 (Grades 7–9)
Global system				
Knowledge	1-1-1 Give examples of global issues related to everyday life	1-2-1 Recognize the relationship between global issues and individual and community life	1-3-1 Investigate the past, present, and future connections and developments of global issues	1-4-1 Assess the influence of the development of various global networks (traffic, communications, social, and economic networks) on humans, animals, and the environment
Skill	1-1-2 Recognize the global networks (traffic, communications, social, and economic networks) that connect individual or community life to the world	1-2-2 Compare the characteristics and connotations of different foreign cultures and products	1-3-2 Analyze the interconnection and interdependence between Taiwan and the rest of the world	1-4-2 Analyze the causes and effects of global issues
Attitude	1-1-3 Realize that local everyday life is part of the global fabric	1-2-3 Be willing to assimilate advantages from foreign cultures and incorporate them into the local culture and environment	1-3-3 Positively view the resolution of global issues	1-4-3 Believe that global issues can be improved through individual and group actions
Multiculture				
Knowledge	2-1-1 Understand the cultural characteristics of your community and country	2-2-1 Understand the customs of different groups in local and neighboring communities	2-3-1 Reflect on your own culture from the perspective of other cultures	2-4-1 Discuss the values, beliefs, and contributions of different cultures
Skill	2-1-2 Be aware of and respect the similarities and differences between other cultures and your own	2-2-2 Participate in various cultural events in the community	2-3-2 Help eradicate cultural biases and discrimination in society	2-4-2 Use various channels and methods to promote cross-cultural understanding
Attitude	2-1-3 Appreciate the cultural characteristics of the community	2-2-3 Appreciate and respect the diversity of other cultures	2-3-3 Be willing to understand and learn about different cultures	2-4-3 Be willing to solve global issues through cross-cultural cooperation
Social justice and human rights				
Knowledge	3-1-1 Be aware of whether you and others have been treated fairly	3-2-1 Understand the Declaration of the Rights of the Child adopted by the UN	3-3-1 Understand the basic human rights guaranteed by the constitution	3-4-1 Understand the value and importance of human rights
Skill	3-1-2 Recognize the causes, processes, and results of injustice in everyday life	3-2-2 Discover channels for helping people whose human rights have been violated	3-3-2 Identify various forms of social inequality and injustice, and adopt appropriate action for improvement	3-4-2 Formulate appropriate methods and strive for a more equal and just world
Attitude	3-1-3 Cultivate the courage to point out the injustices around you	3-2-3 Respect your rights and those of others, and display empathy	3-3-3 Cultivate responsibility for and participation in public affairs	3-4-3 Show consideration for global affairs, and realize the responsibilities of global citizens
World peace				
Knowledge	4-1-1 Understand the meaning of cooperation	4-2-1 Understand different view points and perspectives during interpersonal, individual, and group conflicts	4-3-1 Recognize the international organizations that uphold world peace	4-4-1 Analyze the competition- or cultural difference-induced cooperation, conflicts, and adverse relationships between countries
Skill	4-1-2 Develop mutual aid and cooperation skills	4-2-2 Communicate with others openly and respectfully	4-3-2 Reflect conflicts (past and present) in our society and others	4-4-2 Simulate conflict resolution skills, such as communication, negotiation, and cooperation

Table 3 continued

Core concepts	Stage 1 (Grades 1–2)	Stage 2 (Grades 3–4)	Stage 3 (Grades 5–6)	Stage 4 (Grades 7–9)
Attitude	4-1-3 Be willing to cooperate within a group	4-2-3 Be willing to resolve conflicts at school and in the family	4-3-3 Realize the importance of interpersonal, individual, and group harmony	4-4-3 Realize that communication, negotiation, and cooperation are necessary for improving world peace
Ecological sustainability				
Knowledge	5-1-1 Recognize the global environmental problems relevant to your surrounding environment	5-2-1 Be aware of limited natural resources	5-3-1 Analyze the relationships among personal, community, and global environments	5-4-1 Design projects that facilitate global sustainable development
Skill	5-1-2 Protect the environment in everyday life	5-2-2 Propose feasible strategies that improve environmental problems in the community	5-3-2 Effectively argue the importance of ecological sustainability	5-4-2 Evaluate feasible methods for mankind to improve global environmental issues
Attitude	5-1-3 Cultivate a positive attitude toward sustainable environmental development	5-2-3 Be willing to participate in environmental protection activities	5-3-3 Be willing to take responsibility for conserving the environment	5-4-3 Cultivate a personal lifestyle suitable for a sustainable world

Table 4 Statistical table of the core concepts for global/international education in the learning areas of *Grade 1–9 Curriculum Guidelines*

Learning areas	Core concept						Total of indicators for global education	Total of indicators for learning areas	Proportion (%)	Rank
	Global system	Multiculture	Social justice and human rights	World peace	Ecological sustainability					
Language										
Arts	3	27	0	18	0	48	755	6.36	6	
Mandarin	3	6	0	14	0	23	424	5.42		
Dialects	0	12	0	2	0	14	538	2.60		
English	0	9	0	2	0	11	97	11.34		
Health and physical education	1	4	1	3	3	12	109	11.01	4	
Social studies	19	6	9	7	6	47	146	32.19	2	
Arts and humanities	0	4	0	3	1	8	93	8.60	5	
Science and technology	3	1	0	3	11	28	234	11.97	3	
Mathematics	0	1	0	0	0	1	171	0.58	7	
Integrative activities	0	9	2	3	9	23	52	44.23	1	
Total	36	52	12	37	30	167	1,560	10.7		

Total of indicators for global education = Global system + Multiculture + Social justice and human rights + World peace + Ecological sustainability
 Proportion (%) = $\frac{\text{Total of indicators for global education}}{\text{Total of indicators for learning areas}} \times 100\%$

integrative activities area emphasizes child-centeredness and links learning experiences under different subjects; this is expected to foster global education.

Disciplinary knowledge may also affect the infusion of global core concepts into learning areas. For example, science and technology indicators were more strongly related to global system and ecological sustainability than to other core concepts. In language arts, over half the related indicators revolved around multicultural. Most of

the competence indicators related to social justice and human rights were found in social studies, whereas some learning areas were completely unrelated to social justice. It is notable that only one mathematics indicator revolved around global education. Bourn (2012) may help in explaining this result; little guidance or advice on global dimensions has been provided to mathematics teachers. Few resources have specifically addressed the relationship between global education and mathematics, yet this subject

is potentially one of the most globally relevant. Its roots and influences may go back to different regions of the world. Important mathematical skills, such as statistics and data interpretation, are relevant to global issues, including fair trade, international debt, population growth, migration, and human development indices. In a globalized society, each subject can be a global subject. It is essential to effectively integrate global education with subject knowledge.

Implications and Conclusion

Our findings can serve as a reference for educators who want to explore standards and benchmarks, so as to frame discussions of external comparison and internal improvement in terms of global education (Oden 2007). The developed core concepts and competence indicators for global/international education can be linked to Taiwan's *Grade 1–9 Curriculum Guidelines* and serve multiple purposes for different educational stakeholders. Educational leaders and policy-makers can apply these to incorporate a global/international dimension into national curricula, as well as to evaluate and compare the progress toward implementing related policies or programs. Teacher educators can refer to them when planning teacher-training programs or courses. Schoolteachers can apply them to infuse a global/international dimension into curricula and select relevant content and activities for the learning area being taught. These concepts and indicators can also serve as a checklist for revising curricula that currently ignore some global/international core concepts or dimensions (i.e., social justice and human rights). Furthermore, they can be applied to assess students' performance and reveal their progress at different learning stages.

The developmental methods and procedures adopted in this study can serve as a motivation for other countries interested in connecting global/international education to their national curricula. However, further research is advisable. The core concepts, keywords and competence indicators should be reviewed and revised in accordance with the context of different schools, regions, or countries. Global/international education is a new trend for grades 1–9 in Taiwan, and it is something with which the average teacher is unfamiliar, so experts and scholars were surveyed in the present study. However, since the panel excluded those who actually teach global issues, the usefulness of this framework within schools may be limited. As more teachers and schools join international education projects through MOE grants, their opinions should be reflected in further research. In addition, we developed this study for Taiwan's *Grade 1–9 Curriculum Guidelines*, and further study may be extended to Grade K–12. Finally, we hope that this study elucidates the relationship between

national curricula and global/international education, leading to new research that consolidates findings on curriculum standards for global/international education.

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