

# Education for Sustainable Development to Nurture Sensibility and Creativity

## **An interdisciplinary approach based on collaboration between *kateika* (Japanese home economics), art, and music departments in a Japanese primary school**

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### **Abstract**

The objectives of the research reported in this article were to develop and evaluate an interdisciplinary primary school Education for Sustainable Development (ESD) curriculum as a collaboration among the subject areas of *kateika* (Japanese home economics), art, and music. In our curriculum, which focused on the improvement of 'sensibility and creativity' as embodied knowledge, the students were encouraged to use their five senses, express their feelings and ideas, and to freely explore their imaginations. Our sample consisted of 38 sixth-graders in the primary school attached to a national university. Assessment of curriculum effectiveness revealed that the students learned to think about alternatives while questioning convention, to use all five senses, and to look at things from different angles. The students were also encouraged to explore and pursue their personal interests and to develop the motivation and determination to put forth effort in order to succeed.

**Keywords:** Education for Sustainable Development, interdisciplinary approach, embodied knowledge, *kateika* (Japanese home economics), sensibility and creativity, art and music

## Introduction: Research framework

### Educational context for sustainable development in Japan

Efforts to implement Education for Sustainable Development (ESD), the goal of which is an education through which our children can achieve a sustainable future, are being undertaken around the world. A World Summit on Sustainable Development (WSSD) was held in Johannesburg in 2002, at which a 'Decade of ESD' (DESD) was declared and ESD defined as learning to:

*help people to develop the attitudes, skills, perspectives and knowledge to make informed decisions and act upon them for the benefit of themselves and others, now and in the future. ESD helps the citizens of the world to learn their way to a more sustainable future.*

(UNESCO, 2014)

Various agencies within the Japanese government, including the Ministry of Foreign Affairs, the Ministry of Education, Culture, Sports, Science, and Technology (MEXT), and the Ministry of the Environment, are actively engaged in pursuing the goals of the DESD to implement ESD. In Japan, ESD is defined as 'education that enables individuals to recognize that they exist in relation to people around the world, future generations, and their environment, and to change their behavior accordingly' (MEXT, 2013). The new government-approved guidelines for kindergarten, primary, and second school curricula explicitly include 'education for sustainable development', and ESD is already being implemented and experience is being accumulated in various subject areas (National Institute for Education Policy Research, 2013).

In Japan, ESD has been implemented in a variety of subject areas at all educational phases, including primary school (Kodama, 2009; Kishimoto and Sato, 2010), junior high school (Ezaki *et al.*, 2010) and senior high school (Yuasa *et al.*, 2010, 2011). MEXT and the Japanese National Commission for UNESCO have positioned the UNESCO Associated Schools Project Network (ASPnet) as centres for ESD promotion. Many ASPnet member schools have implemented ESD, with a primary focus on topics related to the environment, energy, global issues, community, and traditional culture (UNESCO Associated Schools Project Network, 2012).

One of the reasons that ESD has been concentrated in these topics is because the objectives and content of these topics overlap with the objectives and content of conventional environmental education in Japanese schools and thus are easily incorporated by teachers as part of their regular classes. However, the goal of ESD

should be not only the acquisition of knowledge through such topics but also the acquisition of skills and attitudes for sustainability. The Japan Council on the UN Decade of Education for Sustainable Development (ESD-J) stresses the importance of helping students develop the 'values' and 'abilities' necessary for achieving sustainability. Now especially, having experienced the recovery process following the Great East Japan Earthquake of March 2011, educators and those involved in education in Japan are not only acutely aware of the importance of ESD but are being asked to rethink ESD from the standpoint of true 'sustainability' whereby children are able to think, act, and continually revise their behaviour on their own. Following the disaster, several educators involved in ESD published a guidebook titled *To You, for Creating the Future* (ESD-J, 2011). What was highlighted in this book was the importance of having the courage to change ourselves. The book points out that the lessons learned from the painful experiences of the disaster can and should serve as a guideline for a paradigm shift in ESD. The book, based on the Japanese experience, represents an important Japanese contribution to ESD.

### **Interdisciplinary curricula in ESD**

In discussions among Western educators, the value of an interdisciplinary approach to sustainability education seems to be taken for granted (Feng, 2012), reflecting widely held views about the inherent complexity and uncertainty of sustainability issues. Stables and Scott (2001) have argued, however, that educators' desire for an interdisciplinary approach is, at least in part, thwarted by the incompatibility of discourse in different subject areas. While discussion about how each discipline and subject area can contribute to ESD is indeed necessary, what is essential is an interdisciplinary approach. Sterling (2005) pointed out that 'sustainable education' is a generic and inclusive term that accommodates diverse interpretations and that such education must cut across disciplinary boundaries to promote the development of unique or transferable questioning and critical thinking skills.

Holistic thinking is highly regarded in ESD-related literature (DESD), and the interdisciplinary aspects of ESD are valued in Japan as well. Maruyama (2010) advocated that ESD should be interdisciplinary and holistic. The ESD-J also emphasizes the fact that sustainability-related issues, such as the environment, poverty, human rights, peace, and development, are complicated and require a comprehensive approach. The ESD-J also calls for ESD to apply experience-based and problem-solving approaches to real life and in real local community settings to seek solutions to unsustainable social issues. On this point, the ESD-J is in agreement with Scott (2009), who argued that ESD-related research needs to focus more closely on understanding the ways in which learning affects people's lives.

As Nagata (2010) astutely pointed out, it is essential that schools implementing ESD address the fundamental rationale for sustainable development as it relates to all aspects of education, including pedagogical philosophy and curriculum design, architectural form and design, school lunch, school management, teacher-student relationships, etc.

That is, the practice of ESD entails a reorientation of conventional education, which has played a part in creating the current unsustainable society, and also seeks a paradigm shift for future education. The purpose, then, of this study is to propose a new ESD model and to consider the potential of this model to effect a reorientation of the current education system and to serve as a new paradigm for future education.

### ***Kateika*, art, and music education in Japan**

In Japan, the discipline of *kateika* (家庭科), which is typically translated as ‘home economics’, is very different from that in other countries. It is a compulsory subject from primary school to secondary school that covers a very broad range of topics. At primary school level, the overall objective of *kateika* education is to enable children to acquire the fundamental knowledge and skills necessary for everyday life, through practical and hands-on activities (MEXT, 2008a). At secondary school level, the goal is for students to acquire the knowledge and skills necessary to lead independent lives or to develop the skills and attitudes necessary to enhance and improve their lives (MEXT, 2011a, 2011b).

Table 1 shows the content of *kateika* curricula at primary and secondary school levels. *Kateika*’s purview includes not only the acquisition of life skills related to diet, clothing, and housing but also education regarding family and home life, child development, and nursing (The Japan Association of Home Economics Education, 2004). In the implementation of *kateika* curricula in school, students learn about interpersonal relationships through role-playing activities and actual social interactions with children and the elderly. At all school levels, students have the chance to learn about the environment as it relates to their daily lives through curricula that are designed to encourage students to identify societal concerns and to successfully negotiate the challenges of living in a diverse, global society. As such, Nakayama *et al.* (2013) argue that *kateika* is very close to ESD in terms of its contents. It has been pointed out in other countries as well that home economics as a discipline shares certain objectives and content with ESD. Dewhurst and Pendergast (2011) reported that home economics teachers in four countries, including Scotland and Australia, see the potential for home economics to contribute to ESD.

**Table 1: *Kateika* syllabus in Japan**

<b>Primary school</b>
Family and family life
Daily meals and basic cooking
Comfortable clothing and housing
Daily consumption and the environment
<b>Secondary school (7–9th grades)</b>
Family, home, and child development
Food, cooking, and independent life
Clothing, housing, and independent life
Daily consumption and the environment
<b>Secondary school (10–12th grades)</b>
Human life, family, and home
Relationship with children and elderly people, and welfare
Financial planning and consumption
Life science and the environment
Life planning
Home projects and school home economics club activities

Meanwhile, art and music education in Japan has focused on the acquisition of subject-specific knowledge and skills. According to the ‘Courses of Study’, which set forth official curriculum guidelines (MEXT, 2008b), the goal of art and handicraft classes in primary school is for students to create something based on the unique features of a material and/or location. The guidelines also stress the importance of enabling children to express themselves via drawings or paintings. At higher school levels, the acquisition of the technical skills required for producing handicrafts or drawings, or painting well, becomes an important goal of art education. Jinno (2006) criticized Japanese in-school arts education for having focused historically on the acquisition of technical skill.

Music education in Japanese schools has had a similar focus. According to the Courses of Study<sup>1</sup> for primary school (MEXT, 2008c), the goal of music classes is for students to be able to sing and play instruments after listening to a sample, taking into account various aspects of performance. This reflects the underlying view that regards technical skills such as singing and playing instruments as significant. As a counterpoint to this view, Tsubono (2012) established the Institute of Creative Music Activity for Children, which has explored innovative lesson plans for over 20 years. It has been reported that children enjoy the various activities incorporated into these lesson plans and exhibit the potentiality of sensibility and creativity.

Although we can find examples of practices by artists aimed at developing children's creativity (Yokohama-shi Geijyutu Bunka Kyoiku Platform, 2013), few studies have tried to develop holistic approaches to art and music education in Japan (Nakayama and Ito, 2012). Moreover, art and music education is rarely discussed in the context of ESD in Japan.

The Courses of Study stipulate that ESD should be promoted in the following subject areas: social studies, science, technology, *kateika*, moral education, and integrated studies.<sup>2</sup> Given that this latter subject area was originally created to allow schools to implement unique educational activities, it may be more pertinent to ESD than the other subject areas. However, the number of hours allocated to integrated studies has been reduced in recent curriculum reform. As such, ESD has to survive by finding a home in various other subjects. The UNESCO Associated Schools Project Network (2009) provides examples of the cross-curricular approaches being used to develop and implement ESD in various subjects at all school levels. However, examples of such cross-curricular approaches are notably lacking in three subject areas: *kateika*, art, and music.

### **Embodied knowledge in ESD**

Especially in the modern societies of developed countries marked by advanced specialization and compartmentalization, cutting-edge research in narrow and highly specialized areas tends to be promoted, while broad-scope perspectives tend to be pushed to the sidelines. However, immediately following the Great East Japan Earthquake of 2011, people facing a situation in which lifelines were cut and communication was interrupted somehow managed to survive by collecting information using their five senses, making decisions and choosing courses of action based on this information. This very real situation demonstrates the need at this juncture to re-examine our conventional understanding of knowledge and skill (Otake *et al.*, 2012). At the same time, Japanese researchers have to identify a new direction for ESD, to help students improve their sensibility and creativity for 'learning their way' to a more sustainable future.

Sterling (2001) emphasized that ESD should play a key role in reorienting conventional education and that it should essentially be transformative, constructive, and participatory. To this end, insight can be gained from the educational theory and practice of the Reggio Emilia approach. This approach, the theory and practice of which are intended to help children learn actively through aesthetic appreciation and artistic methods, is highly regarded in the field of early childhood education (Vecchi, 2010). Muto (2009) also emphasized the importance of sensibility and creativity in early childhood education related to embodied knowledge, which children acquire using their whole bodies, including their five senses. Hopkins and McKeown (2001)

introduced the Toronto Board of Education's principles of ESD, which comment on the importance of aesthetic appreciation and creativity. They note that, as an outcome of ESD, students should acquire sensitivity towards the aesthetic dimensions of the natural and human world, develop flexible and imaginative ways of thinking, and participate in creative activity and expression.

O'Loughlin (1998) also argues that there is a need for a conception of embodiment in which bodies are not simply subject to external agencies but, rather, are simultaneously agents in their own social construction of the world. Shusterman (2006) coined the term and concept 'somaesthetics', in which the body is defined as a locus of sensory-aesthetic appreciation (aesthesis) and creative self-fashioning. Tanaka (2011) argued that embodied knowledge is concerned with the variety of human experiences. These concepts require a shift in paradigm to break away from the current relationship between conventional education and specialized/compartmentalized knowledge. In other words, ESD requires that we prioritize the ability of students to feel and think independently and to express their feeling and thoughts (ESD-J, 2007). To promote these abilities through ESD, we must learn to understand various issues based on our 'embodied knowledge' of those issues. Such an approach has enormous potential for enabling us to overcome the specialization and compartmentalization that prevent us from achieving broader perspectives.

## Objective and methods

### Research objectives

The goal of the research reported here was to develop a pilot ESD curriculum for nurturing children's sensibility and creativity as embodied knowledge. A secondary aim was to develop the potential for collaboration between *kateika* and arts and music education to create an enjoyable ESD learning model and to renew pedagogy in arts and music education. The specific research objectives were as follows:

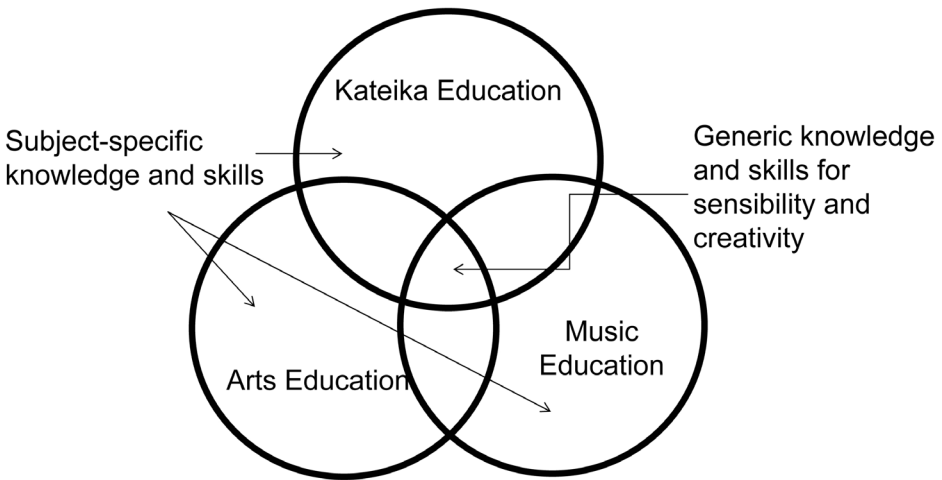
1. To develop an interdisciplinary primary school curriculum for sustainability education through collaboration between *kateika*, arts, and music subject areas.
2. To assess the effectiveness of this curriculum.

### Curriculum development

In this research we hoped to develop students' sensibility and creativity through their five senses as embodied knowledge, which would enable the students to confidently express their feelings and empower their imaginative abilities. As illustrated in Figure 1, the curriculum was developed to nurture students' sensibility and creativity as generic knowledge and skills through the collaboration of three

subject areas: *kateika*, art, and music. In Japan, *kateika*'s purview is considered to be the entirety of life experience; meanwhile the purview of art and music education is the cultivation of 'sensibility and creativity'. We believed that, by integrating these different perspectives in ESD, the unique natures of each subject area could become richly linked within each individual. Such an approach involves not only an integration of different topics but, rather, a collaboration that takes advantage of the learning discourse in each subject area. The implementation of ESD should ultimately reorient and improve the quality of each subject area (Sterling, 2005).

**Figure 1: Sensibility and creativity as generic knowledge and skills**



### Curriculum content and execution

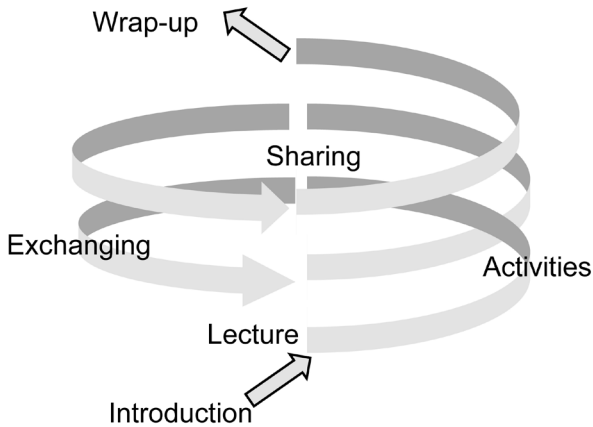
In developing a curriculum for nurturing children's sensibility and creativity, we needed to make decisions regarding lesson content and other practical matters. Table 2 shows how the key elements within sensibility and creativity are related to the curriculum contents. As for execution of the curriculum, the typical flow consisted of introduction of the class material, followed by various processes consisting of lectures, activities, and sharing. The curriculum was executed in each subject area (*kateika*, art, and music) via action research. As indicated in Figure 2, a final wrap-up activity was also conducted.



**Table 2: Relations between sensibility, creativity, and curriculum content**

		<i>Kateika</i>	Art	Music
Sensibility	Using five senses	Sight, smell, taste	Sight, touch	Hearing
	Respecting their own feelings	Filling in the blank in the phrase '_____-friendly'	Looking for various objects	Listening to the various sounds
	Respecting their own ideas	Walking around the school with camera in hand	Choosing a 'What in the world is this?' topic	Improvising rhythms using melodicas
Creativity	Expressing their own feelings	Taking photos	Finding an object that gives a good impression	Communicating using instruments
	Imagining	Creating an initial conceptual map	Thinking about what they could renovate	Drawing the shapes of sounds
	Respecting others' feelings and ideas	Seeing photos taken by their classmates	Discussing ideas within their groups	Seeing pictures of the shapes of sounds drawn by their classmates
	Expressing their own ideas	Creating a new conceptual map by adding sticky notes	Presenting to the class as a group	Playing according to the shapes of sounds

**Figure 2: Procedure as an action research spiral**



**Curriculum implementation**

The curriculum was implemented between October 2012 and March 2013 at the primary school attached to one of Japan’s largest national universities located near the Tokyo metropolitan area. The primary school fulfills several functional roles as a school affiliated with the Faculty of Education. The principal role is to host

in-classroom educational trials and to cooperate with research by the university faculty. Another role of the school is to enhance the qualifications and abilities of local teachers and to serve as a model school to promote innovative educational activities. The study sample for our research comprised 38 sixth-graders. The curriculum was designed, developed, and executed by five researchers at the university whose areas of expertise were *kateika*, art, and music education. Primary school teachers also assisted with implementation of the curriculum. It took into consideration relationships and connections that would be coherent and relevant to the students.

The curriculum consisted of eight hours' worth of lessons, the specific contents of which are shown in Table 3. Lessons 1 to 3 were taught by *kateika* education researchers, lesson 4 by the art education researcher, and lesson 5 by music education researchers. *Kateika* education researchers were again in charge of the last lesson.

**Table 3: Lessons and facilitators**

Lesson	Duration	Facilitator
1 Introduction	1h	<i>Kateika</i> education researcher
2 Making concept maps	1h	<i>Kateika</i> education researcher
3 Photo elicitation method	1h	<i>Kateika</i> education researcher
4 School renovation plan	2h	Arts education researcher
5 Impromptu music	2h	Music education researcher
6 Wrap-up activity	1h	<i>Kateika</i> education researcher

***Introduction: Overview of the curriculum as a whole***

It is reported that, following the Great East Japan Earthquake, children who had lost their 'play areas' began losing vitality. Using one's whole body and all five senses to feel and to enjoy are central to 'living.' We asked students 'What do you do in a class?' The aim of the question was to help the students understand that the goal of the curriculum was not to acquire abilities or life skills for the sake of performance or making a piece of art but, rather, to enjoy the process of feeling, thinking creatively, and expressing one's self. We introduced the key phrase 'Let's Enjoy Feeling' as a way to help the students to focus on this concept.

***Making concept maps***

In this lesson, our goal was to have students experience firsthand the joy of taking an idea, fleshing it out, and expressing it in their own words. We first had the students work on making a concept map, i.e. a diagram showing the relationships between concepts. Concept maps allow students to visually organize and express their ideas. The students were asked to complete the phrase '\_\_\_\_-friendly', using any word of their choosing to fill in the blank. Of the 38 students, 9 chose the phrase

'earth-friendly', while 8 chose 'human-friendly', 7 chose 'eco-friendly', and 5 chose 'my-soul-friendly' as their topic. After the students chose a topic they created mini mind maps related to their chosen topic using sticky notes. The students used a wide range of words related to the earth, people, the environment, and one's self. For example, students who chose the topic 'earth-friendly' created mini mind maps including terms such as 'the 3Rs' (reduce, reuse and recycle), 'alternative energy', 'sorted garbage', and 'protecting nature'.

### ***Photo elicitation method***

In this lesson we challenged the students to take pictures expressing each of the words they had used to complete the expression '\_\_\_\_-friendly'. Permission was obtained from pupils and parents to reproduce the images used in this article. The sight of students walking around inside and outside the school with cameras in hand and having a good time taking photographs left a lasting impression. For instance, a male student took a photograph of a picture of magnolia trees to represent the phrase 'earth-friendly' (see Photo 1).

### **Photo 1: Magnolia trees**



Photograph by a student; used with permission.

Another boy took a photograph of a wooden chair to express the topic ‘human-friendly’ (see Photo 2).

### Photo 2: Wooden chairs



Photograph by a student; used with permission.

One girl, meanwhile, expressed the topic ‘my-soul-friendly’ through a photograph of her close friend’s smiling face. The photo elicitation method uses photographs to capture perceived environments. It enabled participants to become acquainted with the children’s everyday lives as they saw them. A recent modification to this method, requiring students to provide comments describing the pictures they have taken, makes it possible to not only subjectivize but also to objectivize the relationships between individuals and their environment (Tseng *et al.*, 2001).

### **School renovation plan**

In this lesson, centered on the key expression ‘What in the world is this?’ after explaining through familiar examples the difference between perceptions based on sensibility and those based on conceptual understanding, we had the students search for various objects in the arts and crafts room using a worksheet. The first object could be found based on visual clues, but the other searches required the students to use senses other than sight. In the next class period, we had each student choose a ‘What in the world is this?’ object that they had found that they either ‘felt

good' or 'had a good impression' about. The students then thought about what they could do with the object(s) and wrote down their ideas for a renovation plan using the object(s). One boy's renovation plan entailed a piece of athletic equipment made using ropes and a hammock hung from the ceiling. Finally, we had the students discuss their ideas within their groups and choose one plan to present to the class as a group. The goal was to help the students realize that they can make unexpected discoveries by intentionally looking at the environment around them, which they don't normally pay close attention to, from the standpoint of art, and to have the students experience firsthand that this can lead to new ideas and creations.

### ***Impromptu music***

In this music lesson, centered on the theme 'Let's Feel Sound! Let's Taste Sound!', we had the students 'listen' to sounds with their five senses and freely express this graphically. As an introduction to the lesson, the students carefully listened to the sound of an elephant bell (a bell worn around the neck of an elephant) and a wooden instrument. Thereafter, we attempted to stimulate the students' sensibilities and creativities by introducing works by modern composers, and talked about how sounds are annotated and communicated and how composers come up with ideas for compositions. The students played 'improvised music' using familiar instruments such as melodicas and recorders, enjoying characteristics of sound such as loudness and rhythm and learning to 'communicate' sound. Finally students were challenged to express their feelings through pictures while listening to the sounds of familiar instruments. One student drew a picture of the sound from an elephant bell, while another student chose to express the sounds of a melodica.

### ***Wrap-up activity***

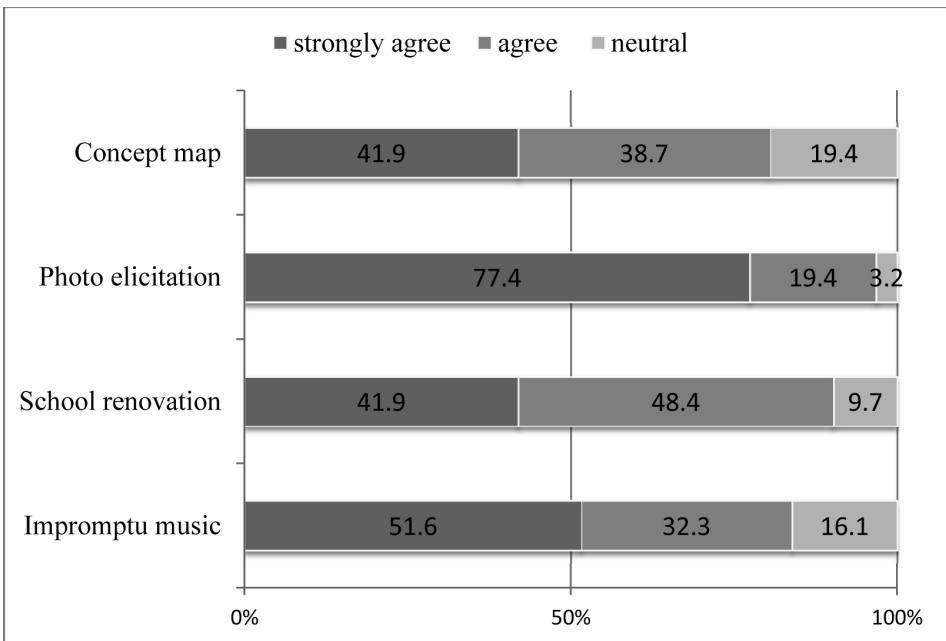
In the wrap-up activity, we asked the students to think about what they had learned through the day's curriculum. The students were able to see how other students expressed their feelings in their photos as they explained why they took certain pictures. Next we had the students create a new conceptual map by rearranging the yellow sticky notes that they had made in the conceptual map lesson (lesson 2) and by adding blue sticky notes. This activity was intended to help students reflect on and recognize what they had learned over the course of the lessons.

### **Assessment of the curriculum**

Three methods were used to assess the ESD curriculum. First, students were asked four assessment-related questions regarding each lesson. Second, a questionnaire, consisting of seven items eliciting the students' reflections on how their thinking changed during and after the lessons, was conducted. Third, students were asked to write free comments about the lessons.

First, we asked the students how much they were interested in each of the lessons (concept map, photo elicitation, school renovation, and impromptu music). Students indicated their degree of agreement on a five-point scale, with responses being strongly agree (1), agree (2), neutral (3), disagree (4), and strongly disagree (5). As shown in Figure 3, for the concept map lesson 41.9 per cent responded 'strongly agree', 38.7 per cent responded 'agree', and 19.4 per cent responded 'neutral'. Regarding the photo elicitation lesson, nearly all students responded 'strongly agree' (77.4 per cent) or 'agree' (19.4 per cent), while 3.2 per cent of the students responded that they were neutral. For the school renovation lesson, 41.9 per cent of students responded 'strongly agree', 48.4 per cent of students responded 'agree', and 9.7 per cent of students responded 'neutral'. For the impromptu music lesson, most students responded 'strongly agree' (51.6 per cent) or 'agree' (32.3 per cent), while 16.1 per cent of students responded 'neutral'. Since none of the students responded 'disagree' or 'strongly disagree' to any of the questions, it was concluded that most students were interested in all of the curriculum activities. These results indicate that the photo elicitation lesson was the most popular among the activities offered, suggesting in turn that this approach is an easy way to get primary school students to express their own ideas and thoughts while explaining the photos they took.

**Figure 3: Students agreeing each lesson was interesting**



Next, we asked students how their feelings or perceptions regarding the diversity of ideas, the value of sensitivity, the idea of sharing one's feelings or ideas with others, and understanding of others had changed after the lesson using the following statements. The statements were chosen to reflect the idea that, in order to nurture students' sensibility and creativity, they must learn to trust in their own unique perceptions, ideas, and creative thinking, while also respecting the sensibility and creativity of others, which may differ from one's own.

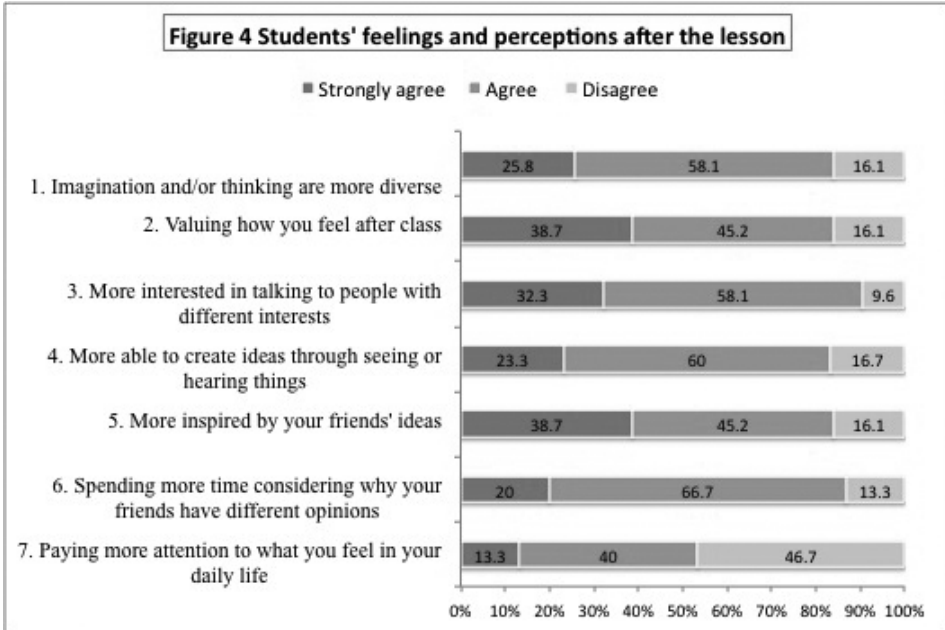
1. Your imagination and/or thinking are more diverse than before.
2. After the class you have come to value how you feel.
3. You are more interested in talking to people with different interests and ways of thinking than before.
4. You are more able to create ideas through seeing or hearing things than before.
5. You are more inspired by your friends' ideas than before.
6. When your friends have different opinions from yours, you take more time considering why they think the way they do than before.
7. You pay more attention to what you feel in your daily life.

Students indicated their degree of agreement on a three-point scale, with responses being strongly agree (1), agree (2), and disagree (3). The results of this questionnaire are shown in Figure 4. It was found that 25.8 per cent of the students 'strongly agreed' and 58.1 per cent of students 'agreed' that their imagination and/or thinking had become more diverse. When asked if they had come, after the class, to value how they feel, 38.7 per cent of students answered 'strongly agree' and 45.2 per cent responded 'agree'. As for the statement that students came to like talking with people who had different interests and thoughts, 32.3 per cent of students 'strongly agreed' and 58.1 per cent of student 'agreed' that they were more interested than before in talking to people with different interests and ways of thinking.

Asked whether they were more able to come up with new ideas than before, nearly all of the students responded 'strongly agree' or 'agree' (about 85 per cent). 38.7 per cent of the students responded that they 'strongly agreed' and 45.2 per cent responded that they 'agreed' with the statement that they were more inspired their friends' ideas than before, while 16.1 per cent of the students 'disagreed' with the statement. When asked whether they now took more time considering why their classmates think differently from themselves, about 85 per cent of students 'strongly agreed' or 'agreed'. The final statement, regarding whether or not the students paid more attention to

their feelings in their daily lives, yielded an interesting result: 53.3 per cent of the students ‘agreed’ with the statement, while 46.7 per cent ‘disagreed’.

**Figure 4: Students’ feelings and perceptions after the lesson**



Finally, we present a few examples of students’ comments indicating the educational effectiveness of our ESD curriculum. One student noted, ‘I am interested in discovering new things in the art room. I have often used this room but there are many things that I have not noticed before.’ Another student commented, ‘I was interested in expressing myself freely in the music workshop.’ Still another student explained, ‘I learned many things in this lesson. The more we carefully look our everyday lives, the more interesting things I can find in it’.

## Discussion

The objective of this research was to develop and execute lesson plans whose educational goal is the acquisition of the embodied knowledge that we describe as ‘sensibility and creativity’. The lessons were executed as part of a collaboration among researchers specializing in the subject areas of *kateika*, art, and music.

The assessment revealed that a relatively high percentage of the primary school students were interested in the photo elicitation lesson. Previously, Oishi (2010) identified a number of advantages of this method: (i) it allows visual expression



of an individual's internal world, which may not be transmittable through verbal expression; (ii) it is free of disadvantages related to variability in the drawing skills and drawing speed of individuals; and (iii) it thus enables us to see children's favoured features in their everyday lives. The method potentially provides an easy way for students (individuals) to express their ideas and thoughts through photos and the explanations thereof. Ito *et al.* (2012) also points out that digital cameras are becoming a natural part of our children's world. This result suggests some useful functions of the photo elicitation lesson for our children.

Another notable result from the research is that no difference in the levels of students' interest between the music and art lessons was observed. Some studies have reported that primary school students prefer the subject areas of *kateika* and art and dislike music, a trend that is particularly strong among male students and grows stronger at higher education level (Sumiya and Muto, 2004; Sugimura, 1995). However, as indicated by the students' comments, the students enjoyed creating the school renovation plan and expressing their own music, both lessons representing alternative approaches to traditional subject matter. The approaches used in both lessons provided students with opportunities to find links to other domains of thought under the common theme of 'holistic thinking'.

Based on the students' reflections on how their feelings and thoughts had changed after the lessons, we conclude that the students felt that their holistic thinking had improved. Students came to understand the importance of sharing ideas with their friends and of respecting the views of others that may differ from their own. The primary school teacher who collaborated with the researchers noted that the curriculum provided the students with a unique opportunity to take part in lessons offered by experts in each of the respective fields. The opportunity to participate in such classes has left a deep impression on the students, which will stay with them for the rest of their lives.

Generally, science, social studies and *kateika* have been regarded as subject areas suited to ESD, while it has been assumed that subjects such as art and music are less compatible with ESD. One reason for this may be related to the fact that, in Japan, ESD activities have been primarily conducted with the goal of promoting environmental conservation and, thus, have been considered in the context of conventional environmental education (MEXT, 2013). However, this pilot study demonstrates the potential for implementing ESD in art and music through collaboration with *kateika*, which has a broad perspective covering the entirety of life experience. Art and music education, by its very nature, focuses on the cultivation of 'sensibility and creativity'. If these can be integrated into ESD, the specialized nature of each subject area will become richly linked within each individual.

## Conclusion

In analysing the project as a whole, the following three factors emerge as constituents of 'sensibility and creativity':

- (1) In a variety of settings, to think about alternatives while, at times, questioning convention, using all five senses, and looking at things from different angles.
- (2) To explore and pursue one's personal interests/fixations. To have the motivation and determination to put forth effort in order to succeed.
- (3) To recognize that different people have different perceptions and diverse value systems.

In this research we were able to clarify the effectiveness of our pilot ESD curriculum. There is a tendency to think that *kateika*, art, and music have nothing in common as academic disciplines. However, the three subject areas were effectively brought together by using the key concept of 'sensibility and creativity' as embodied knowledge and by taking advantage of each subject area's expertise.

ESD strives to change learners' values and behaviours in order to promote sustainable development. To this end, ESD must create an environment in which learners are able to encounter various ideas and ways of thinking, which will stimulate them to rethink their own value and behaviours. This pilot curriculum gave students a chance to enhance their self-esteem by acknowledging and developing their own sensibility and creativity and by recognizing and valuing classmates' sensibility and creativity. We believe that, through this pilot study, we succeeded in presenting a new dimension of ESD based on sensibility and creativity. This sensibility and creativity have enormous potential as tools for enabling students to deal with difficulties that may arise in the future.

ESD also requires us to rethink conventional curriculum and pedagogy. We believe that 'sensibility and creativity' calls into question the conventional view, in the context of formal education, that knowledge and skills represent a fixed set of 'academic abilities'. 'Sensibility and creativity' serve as a starting point for renewal and as a wellspring of possibilities. Another important point is that our integrated ESD curriculum offers an innovative window into individual subject areas including *kateika*, art, and music.

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## Notes

1 The Courses of Study are determined by MEXT as broad standards according to which all schools, from kindergarten through to upper secondary level, should organize their programmes in order to ensure a fixed standard of education throughout the country. It has generally, under the current education system, been revised once every ten years (MEXT, 2014).

2 Integrated studies is a subject in primary and secondary schools and was first included in the Courses of Study in 2002.

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