

# Development of ESD-oriented English language Course Materials for Japanese Senior High School Students

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## Abstract

In Japan ESD (Education for Sustainable Development) perspectives are integrated into the Course of Study of every subject and it is thought that cross-curricular teaching is effective in fostering students' polyphyletic thinking that connects various kinds of related areas and world views. However, there are not many practical studies with such a point of view. The reason why ESD has not been widely used is a lack of appropriate teaching materials, instructive curriculums and evaluation methods. The purpose of this study is to develop ESD-oriented English language teaching materials for Japanese senior high school students and evaluate their effects and challenges, and share them with other teachers who do not have much experience with teaching ESD. The author made original English lessons related to the world's food issues including water issues and designed project-based presentation lessons by applying thinking tools which aim to promote polyphyletic thinking. From the result of the questionnaire-based survey, the lessons were favorably accepted by the learners. Future challenges for this study relate to the introduction of the whole school approach to integrate ESD curriculum, the school systems to promote ICT so the materials and methods can be more disseminated among schools, and studying the quantitative methods to evaluate the improvement in the learners' thinking abilities.

**Keywords:** ESD-oriented course materials, Japanese senior high school English lesson, project-based learning, polyphyletic thinking, 'Six Thinking Hats'

## 1. Introduction

In order to promote ESD, it is necessary to connect various kinds of related study fields based on the viewpoint of 'construction of sustainable society' and practice in a comprehensive manner. In ESD, it is aimed at fostering the learners' values on sustainable development (respect for human, diversity, equality and environment, etc.), systematic thinking (understanding the backgrounds of problems, polyphyletic and comprehensive mindset), alternative thinking (critical thinking) ability, analytical thinking, communication ability and leadership. It is also encouraged to facilitate the learners' concrete actions through the process of 'provoke interest → deepen understanding → foster participatory attitude and problem solving ability'. Learner-centered participation type approaches that emphasize on experience, exploration and practice, and effectively inspire the learners' autonomous actions at the learning activities are also recommended. In Japan, ESD perspectives are integrated into the Course of Study of each subject. According to the Ministry of Education, Culture, Sports, Science and Technology (MEXT), at 'English Communication', it is encouraged to design the learning materials and language activities in order to foster the learners' four skills (reading, listening, writing and speaking) by using themes and contents that are appropriate for such activities. It is also recommended to select the contents which are studied in other subjects (social studies and science, etc.) and which foster the learners' interests and attitudes towards communication. It is thought that cross-curricular teaching is effective in fostering students' polyphyletic thinking that

connects various kinds of related areas and world view. However, there are not many practical studies with such a point of view. The reason why ESD has not been widely used is a lack of appropriate teaching materials, instructive curriculum, and evaluation methods.

## **2. Purpose of this study**

The purpose of this study is to develop ESD-oriented English language teaching materials for Japanese senior high school students, evaluate their effects and challenges, and share them with other teachers who do not have much experience with teaching ESD. Specifically, the author made original materials regarding the world water and food issues from the view point of 'global security' by using the data provided by Japan International Cooperation Agency (JICA), Department of Environment and Ministry of Agriculture, Forestry and Fisheries, and so forth. The teaching and evaluation methods to promote learners' autonomous involvement in the lessons and their polyphyletic thinking were integrated so that it leads to a change in their awareness and actions towards the issues. This study also conducted a questionnaire-based survey and examined the result regarding the effect of the lessons.

## **3. Procedure**

### **3.1. Lesson outline**

The world water and the food problems are taught in two units. The lessons were conducted three times per week in English Communication 1 (each lesson is fifty minutes long). In addition to listening and reading English texts, speech, discussions and presentation activities are included in order for the learners' to autonomously participate in the lessons ('Active Learning').

### **3.2 Participants**

The participants of this study are twenty Japanese senior high school students (aged 15-16) and a Japanese teacher and a native Assistant Language Teacher (ALT) from New Zealand. The learners' English level is 'intermediate' and most of them have relatively high motivation towards English learning.

### **3.3 Teaching methods**

#### **3.3.1 Using authentic materials**

In teaching ESD, in order for the learners to understand the backgrounds of the problems, their present situations, and express their own opinions for their solutions, it is necessary to present various sources of data as the grounds for arguments. In this study, the author made original materials by translating the Japanese texts issued by JICA and Development Education Association and Resource Center (DEAR) into easy English for the first grade of senior high school students with supplementary numerical data from websites of related agencies. The essay writing tests were also included in their mid-term and final term examinations.

#### **3.3.2 Integrating cross-curricular lessons**

It is also favorable to cooperate with other subject teachers such as social studies and science, etc., who have expertise about the issues. In this study, a social study teacher taught about the amount of water used in Japan, 'virtual water'(Figure 1), and a nutrition teacher gave lessons about Japan's food self-sufficiency ratio, problems of food loss, and 'local production and consumption'(Figure 2).

### 3.3.3 Inviting a guest speaker

A guest speaker, introduced by RCE Hyogo-Kobe, was also invited to this lesson (Figure 3). He developed the concept of ‘food miles’ and ‘local production and local consumption’ into business. The lecture aimed for the learners’ reflection about the lessons and having them to utilize their learning in their future actions. The lecturer Mr. Hiroki Kanayama had a success in revitalizing his hometown Awaji Island by selling a hamburger using local ingredients (beef, onion and lettuce, etc.) and his burgers won the first prize in ‘local hamburger contest’. Mr. Kanayama devises the menu by using the food from the perspective of ‘virtual water’ and ‘local production and local consumption’. Therefore he became learners’ actual model for them to increase their motivation and change their attitudes towards the problems.



**Figure 1:** Special lesson by a social study teacher



**Figure2:** Special lesson by a nutrition teacher



**Figure 3:** A lecture by a guest speaker

### 3.3.4 Project-based presentation lessons

The main activity of this lesson is the project-based presentation in which the learners explain the current world water and food situation based on what they have learned and present their proposals for their solutions. The presenters are supposed to distinguish between facts and their opinions and show examples and evidence data. The audiences were taught to listen to not only the factual information but also think critically about both the proposal’s merit and demerit and propose their alternative plans.



**Figure 4:** Project-based presentation

### 3.3.5 “Six Thinking Hats” as a polyphyletic thinking tool

“Six Thinking Hats”(de Bono, 1999) was used for this study’s final presentation stage in order for both the presenters and the audiences to be able to deepen their thinking. The feature of this approach is to categorize the thinking aspect into six, and six different colors of these six types of thinking are allotted and the participants are able to wear only one colored hat in order to focus on one type of thinking. If they want to change their thinking type, they have only to change the color of hat and that will lead to well-balanced thinking from various types of view. Table 1 shows the detailed description of “Six Thinking Hats” and its application to this study lesson is shown in Table 2.







## 4. Evaluation method

After the lesson units, a questionnaire-based survey (multiple choice and comments) was administered to the twenty learners. In the multiple choice questions (Table 3), the learners were

asked to answer each question using a five-point scale, with 5 denoting “strongly agree” and 1 denoting “do not agree at all”. In addition to the above, in this survey, the learners were asked to write their comments about their impression of these lessons.

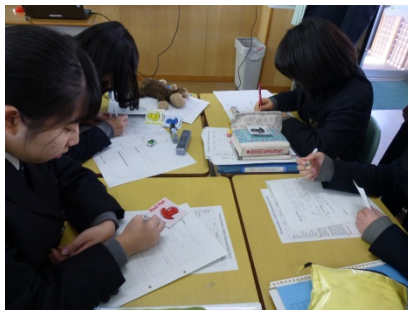
**Table 1:** Six Thinking Hats (de Bono, 1999)

(<http://johnkapeleris.com/blog/wp-content/uploads/2010/10/Six-Thinking-Hats1.jpg>)

COLOURED HAT	THINK OF	DETAILED DESCRIPTION
	<b>White paper</b>	The white hat is about data and information. It is used to record information that is currently available and to identify further information that may be needed.
	<b>Fire and warmth</b>	The red hat is associated with feelings, intuition, and emotion. The red hat allows people to put forward feelings without justification or prejudice.
	<b>Sunshine</b>	The yellow hat is for a positive view of things. It looks for benefits in a situation. This hat encourages a positive view even in people who are always critical.
	<b>A stern judge</b>	The black hat relates to caution. It is used for critical judgement. Sometimes it is easy to overuse the black hat.
	<b>Vegetation and rich growth</b>	The green hat is for creative thinking and generating new ideas. This is your creative thinking cap.
	<b>The sky and overview</b>	The blue hat is about process control. It is used for thinking about thinking. The blue hat asks for summaries, conclusions and decisions.

**Table 2:** ‘Six Thinking Hats’ thinking patterns revised for this study

White Hat	Information	Individually organize the information of the proposal (presentation) and share in a group by using a whiteboard.
Red Hat	Feelings	Express how you felt about the proposal.
Yellow Hat	Merit	Think about the good points, profit, and values of the proposal.
Black Hat	Demerit	Think about the weak points, difficult points for realization, and risks of the proposal.
Green Hat	Alternative	Add a new perspective, think of an alternative plan in the group/class.
Blue Hat	Facilitation	In a group discussion, one of the learners who wear red, yellow or black will wear this blue hat and facilitate the discussion.



**Figure 5:** Individual listening activity



**Figure 6:** Sharing in the group



**Figure 7:** Sharing in the class

**Table 3: Multiple choice questions**

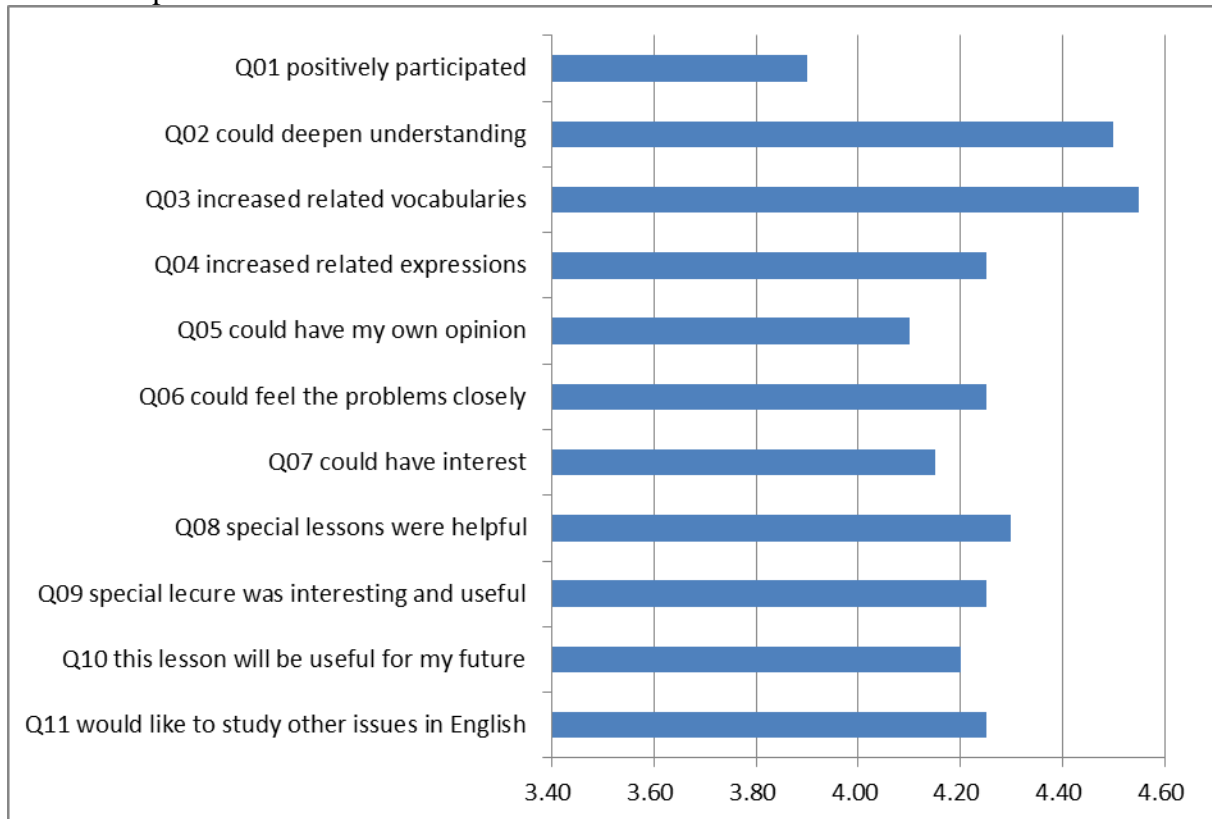
Q 1. I positively participated in the lessons.
Q 2. I could increase my vocabularies related to the world water and food issues.
Q 3. My understanding about these issues was deepened.
Q 4. I could explain about these issues in English.
Q 5. I could express my opinions about these issues in English.
Q 6. I could feel these issues closely to me.
Q 7. I became interested in the study of these issues.
Q 8. The other subject teachers' lessons were helpful to understand these issues.
Q 9. Mr. Kanayama's special lecture was interesting and useful.
Q10. This study about these issues will be useful for my future.
Q11. I would like to study world issues other than water and food problems in English.

## 5. Results and discussion

### 5.1 Multiple choice questions

Figure 8 shows the result of the multiple choice survey.

The average points regarding Q2 (deepening of the understanding), Q5 (obtaining of self-opinion), Q6 (internalization of the issues) were above 4.0 (Q2: $M=4.50$   $SD=0.59$ , Q5: $M=4.10$   $SD=0.70$ , Q6:  $M=4.25$   $SD=0.62$ ). The learners feel that they could deepen their understanding about the problems that they studied at the lessons, feel these problems closely, and could have their own opinions.



**Figure 8: Means obtained in the 5 point scale multiple choice questions (N=20)**

The average points exceeded 4.0 to Q.8 (other subject teachers' lessons) and Q.9 (special lecture) and found that the learners accepted these cross-curricular lessons favorably (Q8:  $M=4.30$   $SD=0.78$ , Q9:  $M=4.25$   $SD=0.89$ ).

Regarding both Q3 (vocabulary acquisition) and Q4 (expression acquisition), the average points were over 4.0 (Q3:  $M=4.55$   $SD=0.59$ , Q4:  $M=4.25$   $SD=0.70$ ). The learners' awareness about their achievement about the acquisition of vocabulary and expression was high.

Although the lesson themes were so serious and difficult that the participation point was relatively lower than other questions (Q1:  $M=3.90$   $SD=0.62$ ), they were keenly interested in these topics (Q7:  $M=4.15$   $SD=0.73$ ), and have desire to utilize their learning results to other international issues (Q10:  $M=4.20$   $SD=0.68$ ) and also study about them in English (Q11:  $M=4.25$   $SD=0.54$ ).

## 5.2 Learners' comments

Table 4 shows the excerpt of the learners' comments on this lesson. As underlined parts show, there are descriptions of deepening their understanding about the issues, change of their problem awareness, and application of what they have learned to their real lives. The favorable comments on cross-curricular lessons, increase of the related vocabularies, and improvement of their English expression ability. The project-based approach and the 'Six Thinking Hats method' for nurturing polyphyletic thinking were also favorably accepted.

**Table 4:** Learners' comment about the lessons (underlines were added by the author)

<p>* First, I did not know why we should study about 'water' and 'food' problems but I gradually understood they are very important issues for the developing countries and they are also closely related to ourselves. <u>When I listened to the presentation through Six Thinking Hats approach, I could concentrate on the listening activity and compiling the information helped to deepen my understanding.</u></p> <p>* <u>I would like to study more about the global issues and utilize what I have learned in this lesson as background knowledge.</u> It was interesting to know that one problem such as water causes various problems such as food shortage, spread of diseases, and deterioration of learning and labour environment. Although it is very difficult to solve these serious problems, it is necessary for us to improve the present situation. In this lesson, we could have challenging experience to <u>make our own solution and explain it in English.</u> Also, <u>through listening others' speeches from multilateral viewpoints, we could think about each idea deeply.</u></p> <p>* I could know about the present situation about the problems in detail <u>by examining authentic numerical data.</u> What I think is good about this lesson is that <u>we could utilize what we have learned by presenting our own solutions</u> not just by reading the texts and understand the situation.</p> <p>* Although we have been taught that we need to solve the world water and food problems, I thought we could not do anything but after this lesson, <u>we could think about what we can do</u> to improve the situation. I knew the word of 'local production and local consumption' but did not know that concept leads to reduce the use of 'virtual water'. I could understand the amount of water we are using and the food loss in Japan and compare these information with those of the developing countries. This study also <u>increased my English vocabularies.</u></p> <p>* It was my first time to learn deeply about the international problems. Through this English lesson, <u>I could obtain the knowledge to become global citizens and think about what we could do as high school students.</u></p> <p>* <u>'Six Hats Thinking' was a very effective way to obtain a new perspective and improve my thinking ability. I could also deepen my learning through the special lectures by other subject teachers and a guest speaker.</u> Through this lesson, I could acquire not just knowledge but <u>what I can practice in my real life.</u></p>
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## 6. Future challenges

### 6.1 The necessity of whole-school approach

As mentioned earlier, the other subjects' teachers cooperation are necessary to have the learners understand the present situation about the global issues. Although the momentum to promote

ESD has been risen at schools, it is very important to design cross-curricular ESD lessons, establish the whole-school system including the staff arrangement.

### **6.2 To deepen thinking in English**

As shown the results of the survey, the learners could deepen their knowledge about the issues, see the problems from various points of view and compile their own opinions through English texts and other materials. However, it would be difficult for Japanese students in English discussion. The use of Japanese language is more effective in the brain storming stage but the chances for learners to speak English became scarce in these English lessons.

Furthermore, it is not enough to examine the results of a questionnaire-based survey in order to verify the effects of these English lessons in fostering the learners' thinking ability. The criteria to measure thinking ability will be needed and the learners' speeches and writing should be assessed by using the text-mining analysis method.

### **6.3 Opening the lesson outcome**

In order to disseminate this study's outcome to other teachers, it is crucial to open the materials, activity and evaluation worksheets and other related data by uploading them on the web. The use of ICT such as iPad and tablet PCs has been encouraged at schools. Since the dissemination of the materials that were developed in this lesson will surely be helpful to promote ESD at Japanese schools, continuous efforts will be needed to organize the web-based systems to open them to the public.

## **7. Conclusion**

According to the survey conducted to Japan's 807 UNESCO Associated Schools Project Network (ASPnet) by MEXT in 2018, as the reasons for ESD has not been disseminated, teachers' lack of understanding about ESD concept (67.3%), how to teach (38.9%), and what to teach (19.1%) were listed among the 465 schools that answered the question. It is pointed out that there is not enough information about what types of ESD activities should be implemented at school and the chances are limited for the ESD practices to be dispatched and shared effectively. It is expected that the effects and challenges of this case study will be widely shared and obtain feedback.

## **Acknowledgement**

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## **References**

- de Bono, E. (1999). *Six Thinking Hats*. New York, Back Bay Books / Little, Brown and Company.
- Japan's Ministry of Education, Culture, Sports, Science and Technology (2018). 'The result of annual survey to UNESCO ASPnet'.