Designing Innovative Global Education Approaches with ICT and New Media

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Abstract

The Global Education Project at Keio University Graduate School of Media Design, Japan, has been conducting several research projects on media design for education, aiming to explore the potential of ICT and new media for designing innovative educational approaches. This paper presents five ongoing approaches created to provide ICT-supported global education opportunities in both formal and non-formal education environments in Japan: Global Kindergarten, KomaKids, Global Workshop, Whitebox, and Peeking Table.The first three projects focus on learning program development, while the last two concentrate on designing tools to support learning and data mining inside the classroom.

Believing that all children should have access to global education from younger ages, we propose specific approaches from kindergarten to primary and secondary school students. Workshop-based initiatives aim to foster global awareness by designing activities for connecting Japanese students with peers in other countries, and providing all participants with global collaboration, creativity, cultural diversity and exchange experiences. Each activity is described from the design to implementation phases, and is followed by evaluation based on each activity's goal. Results from all initiatives are expected to be used as a reference for future works on innovative educational approaches in Asia and other regions.

Keywords: Global Education, ICT, Global awareness, Culture diversity, Global collaboration

1. Introduction

It has been a while since the word "globalization" first appeared. Since 2012, the Japanese government has been working to change education curricula to educate future personnel to live in the global society. The main problem the government has identified about society now is that the number of Japanese students who study abroad is decreasing; furthermore, they have pointed out that there is a need to strengthen English education so that the students will not suffer in communicating with foreign people.[4] It is often and correctly pointed out that the English speaking skills of Japanese people are low; but, more than that, what is regarded as a problem by the institutions accepting Japanese students is a weakness in their skills of self-expression, and in communication overall.

The Global Education Project at Keio University Graduate School of Media Design (KMD), is working on education from preschool to high school levels, including teachers, in order to design educational activities utilising ICT to support global education in Japan. In this paper, four research projects which have been taking place will be described: Global Kindergarten, KomaKids, Global Workshop, and MONO LAB. The first three are workshop-based programmes designed to offer children and students opportunities to have contact with and to think about different cultures. Participants of the workshops will communicate with foreign people—not necessarily through language, so in some situations they must think about how to express themselves non-verbally. MONOLAB is a research project focusing on tangible solutions in workshops and everyday classroom situations. Our goal is

to conduct a variety of workshops through our Global Education program in order to identify common problems, and then provide tangible devices which address these problems.

The Global Education Project team believes that every age group should be able to have access to education through which they are able to raise their global awareness. Below, the concept, approaches and actual results of each research project will be described.

2. EXPERIMENT

2.1. Global Kindergarten

As already mentioned, education in Japanese schools is starting to change. In September of 2012, the University of Tokyo began accepting admissions for returnees and international students; and elementary schools are preparing to introduce English classes as a compulsory subject by 2020. Within that context, Matsufuji (2012)[3] has pointed out that in Japan, pre-school education, which is the first stage of education for children, has not yet had any measures taken. As also mentioned in K-12 Global Competence Grade-Level Indicators[4] as well, pre-schoolers today are also considered to have multiple opportunities to compare different cultures to their own and to be able to notice the difference in other cultures. In fact, in pre-schools in Europe and the U.S., curricula are devised for children to understand diversity, as the children themselves are already diverse in race, nationality and possibly other identities as well. In Japanese pre-schools as well as other institutions, classrooms are not so diverse compared to other countries, which makes it difficult for students to become aware of diversity in the global society on their own. This is why the Global Kindergarten Project was started: to offer children an experience of having cultural exchange.

This is an ongoing project since 2012, and twenty sessions have taken place to date. In this paper, a session that took place on June 2016, which was the twentieth session and was connected with IMMA Kindergarten in Barcelona, Spain, will be examined to explain the project's concept, progress and future development.

2.1.1 METHODOLOGY

As noted, Japanese institutions are lacking in diversity, so what children need is an opportunity for cultural exchange where they can actually have contact with people in a different culture. Therefore, this project aims to design a new educational program for children to introduce each other to their respective cultures through digital communication tools. The sessions include playful activities for children so that they can express themselves non-verbally and understand each other through playing.

A pre-test takes place on the day before the actual program, and the tool to use is decided there after a connection test. For the session with Barcelona, Skype was used. The original plan of the program is described below.

The session with Spain was conducted as follows; the estimated duration was 30 minutes:

1. Greeting
2. Time difference
3. Singing a song (Japan: Cargol treu banya)
4. Cultural performance (Spain: Dance)
5. Cultural performance (Japan: Shichi-go-san, Karate)
6. Playing a game together
7. Sending a message / Q & A
8. High-five [Figure 1]
9. Memorial photo

Figure 1: *Relation between local and remote peer interaction*

10. Singing a song (Spain: Kira-kira boshi)

The participants in this session were aged five to six. Parents of participants were also able to monitor the session from a different classroom.

2.1.2 EVALUATION AND DISCUSSION

Evaluation of children's engagement was done by observing their behaviour during the session; to evaluate the session itself, a questionnaire was distributed to parents. During the pre-test, it was determined that the maximum time for the connection to function sufficiently well for participants to be able to see and hear clearly was 30 minutes. Therefore, the "playing a game" item was deleted from the program beforehand; during the program, the Q & A session was also cancelled. This disappointed some participants, as they had prepared some questions by themselves and were ready to take part. Facilitators replaced children's seats at least once so all the participants were able to see the screen from the front row. This helped them to stay focused on the session taking place, as in previous sessions it was found that children at the back were not able to stay focused throughout the session. Children were capable enough to understand different cultures, time differences, and that children on the other side spoke a different language which was not English. From the questionnaire answers, most parents had the opinion that parts of the program where children could actually perform something, mainly singing and cultural performances, were good as they could see the children enjoying ; but parts where it became more verbal, for example asking questions and sending messages, they seemed to think were less meaningful as they observed their children not understanding each other well.

There have been several improvements already proposed for this project. Tokumoto (2014)[5] has developed a derived project called Global Kindergarten 365. In the original Global Kindergarten Project, the session took the form of a structured curriculum, prepared and facilitated by a teacher. However, in Global Kinder-garten 365, a connected tablet was left unattended in the hallway, and it was up to children themselves to make contact with the other side—so it was a non-structured curriculum. This concept was developed by pointing out that the original program does not bring out children's own motivations to try communicating with people from another culture, as it is difficult for them to directly communicate with each other during the session. Another observation was that although the original project aims to have children teach and learn from each other, the program structure makes it difficult to keep the session children-centred. It follows that the next stage of development is to create a children-centred activity program.

The basic methodology of this next development has already been designed. In this program, participants are given digital cameras to collect pictures from their daily lives, in order to share them with people from different countries during the session. In this way, children will be able to share what they wish to share, and see the culture from their own perspective.

2.2. Komakids

KomaKids is a cross-cultural program aiming at fostering Global Competence in elementary school students through the production of creative media works. In today's world of globalization, the disposition and capacity to understand and act on issues of global significance, so-called "Global Competence", is considered an essential skill for the future. Yet, the effort to promote this skill in school is still hindered. Even though many organizations try to provide a framework for schools, the challenge lies in how to implement this in today's classroom. Thus, this study, with the aim of finding a way to promote Global Competence in school, will describe the implementation of a cross-cultural program using media creation which can successfully foster students' Global Competence from a young age.

The program consists of 4 objectives;

1. To encourage students to explore their

own culture and make comparisons with other cultures.

2. To enhance student awareness of cultural diversity and global issues.

3. To develop student ICT literacy through the use of tablets in a media creation process.

4. To foster students' critical thinking, problem solving and creativity through media creation.

In this program, the students' global competences are expected to be developed in four main ways: first, through learning about foreign culture; second, by reflecting on their own culture through the production of stop-motion animation; third, by sharing their impressions through "pen pal" letters; and fourth, through connecting in real-time with peers from foreign cultures. The detail of each phase are described below.

2.2.1 METHODOLOGY

The KomaKids program is divided into four phases: 1. Learning; 2. Creating; 3. Sharing; 4. Connecting.[Figure 2] Throughout the school semester, four phases of workshops were periodically conducted in the fourth grade class of a Japanese elementary school with a total of 37 students, and the fifth grade class of a Thailand elementary school with a total of 25 students. Each session was 90 minutes long.
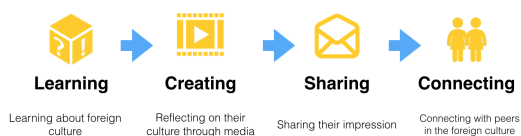

| Learning | Creating | Sharing | Connecting |
| Learning about foreign culture | Reflecting on their culture through media | Sharing their impression | Connecting with peers in the foreign culture |

Figure 2: *Program proposal*

School	Session	Date
Anubaan	Learning	18/08/2015
Watparinayok	Creating	18/08/2015
Bangkok,Thailand	Sharing	09/02/2016
	Connecting	16/02/2016

Table1: *Schedule*

School	Session	Date
Koyo Elementary	Learning	14,16/09/2015
School	Creating	16,25/12/2015
Tokyo,Japan	Sharing	27/01/2016
	Connecting	16/02/2016

Table2: *Schedule*

Phase 1 Learning
In the first phase, the students were introduced to their partner school's information and cultural content through a presentation and quiz game. Next, they learned how to produce an easy stop motion animation using iPads, and tried using it to create a sample work. Creating the stop motion animation involved four main steps: 1. Writing storyboard; 2. Creating background; 3. Creating characters; and 4. Shooting using iPad application. The application used in this program was "KOMA KOMA for iPad" [1]. With the simple four-button user interface of Shoot, Erase, Play and Save, it allowed the students to produce their animation without help from adults.

Phase 2 Creating
In this phase, the students created the stop motion animation to present their cultural story to their foreign friends.[Figure 3] With help from the school, students prepared a storyboard and created characters in advance. Thus, during the session, students had a full 90 minutes to produce the stop motion animation and sound recording. To prevent shaking while holding iPads in their hands, an iPad stand was prepared for them to use. After shooting, students added the sound into their story. Musical instruments from music class were used to produce some background music and sound effects. As a result, there were 27 different stop motion animations depicting daily life and cultural stories, ranging from 2 seconds to 1.5 minutes. All of the works were then uploaded to the KomaKids project website which the students, teachers and parents could access to watch and comment on the videos after the session. (http://komkidtopo.wixsite.com/komakids)

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Figure 3: *Stop motion animation workshop*

Phase 3 Sharing

There were two activities in this phase. First, students accessed the project website to watch and comment on their friends' works. They were encouraged to make the comments using Emoji since that allowed other students who spoke a different language to be able to understand their expression. In addition, for the second activity, students were asked to send "pen pal" letters to their foreign friends. To help them communicate with each other directly without help from adults to translate their letters, phrase cards written in three languages were provided for them to use. Using these, students could simply cut out the word they wanted to say and paste it into the letter. They could also add new words which would later be translated and added to the list. Many students also drew some pictures, and tried to write the foreign language for the first time by copying from the cards. In the end, the letters were sent to the partner school in the foreign country. [Figure 4]

Figure 4: *Pen Pal Letter*

Phase 4 Connecting

In the last phase, students from two countries were connected for a real-time show and tell session. Students brought things existing around them and made presentations about their culture and daily life to their friends. Some example stories were: school lunch, traditional costumes, and traditional music. The facilitator on each side helped to translate the messages they presented to the other side.

2.2.2 EVALUATION AND DISCUSSION

After four phases of the program, a student survey and teacher interview were conducted to measure students' change in Global Competence. This survey was designed based on the Global Competence grade level indicator[4]. As a result, 100% of the students answered that they realized the importance of their culture. 89% of them were glad to learn about foreign countries, and 64% felt that their view of foreign culture changed after experiencing the program. Many students also reflected that they felt enjoyment and would love to join the activity again. [Figure 5]
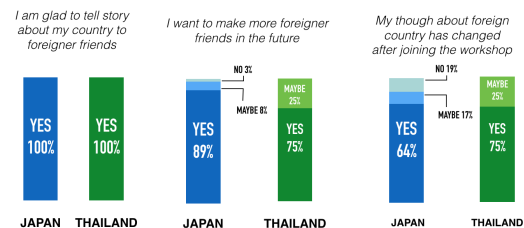

Figure 5: *Survey result*

From the observation, the students showed high interest and sustained engagement throughout the program. They even asked to stay longer after the class period ended. The stop motion animation was an optimal balance between the craftwork which students do in school, and digital work which is a new skill for them. Communication tools such as stop motion animation and three-language phrase cards for writing letters can help lower the language barrier between students, and allow them to communicate freely.

In the teacher interview, the teachers mentioned that there was a change in their students' views toward their culture and foreign countries. The four phases of the program helped students gradually feel connected to their foreign peers. From the results of the field test, it can be said that the cross cultural program using media creation is an effective approach to cultivate Global Competence in elementary school. In the future, it is hoped that this program could be used to make the cross-cultural sharing experience available to students around the world.

2.3.   Global Workshop

Another project showing the Japanese government's concern about global education is Super Global High School (SGH), a project which the Japanese government created to foster global leaders for 21st-century society, with a structure of collaboration between high school and university.

According to this concept, The Global Education Project in KMD Master's Program, in partnership with Fujimigaoka Girls' High School, has been designing and implementing a sustainability program as a compulsory subject for first-year high school students—Global Workshop. Believing that practicing only technical skills is not enough for future society[1], this program aims to foster participants' attitudes towards problem solving and global awareness, as well as improvements in communication, collaboration, and digital literacy skills. This one-year academic credit program was implemented in 2015, and twelve sessions of the workshop have been conducted. In this paper, a workshop conducted in the 2015 academic year will be discussed.

2.3.1   METHODOLOGY

Global Workshop was designed with the goal of creating global leaders for 21st-century society. In this project, a renowned Framework for the Partnership for 21st Century Skills from the US has been adapted to use as an indicator for designing this program, taking into account the differences in educational systems and the current condition of education in Japan.

This single-academic-year program is divided into two modules for each semester with globally related topics—Global Society and Global Environment—for 100 participating first-year high school students. Moreover, this program also collaborates with several schools in other countries which are conducting the same workshop locally, and also invites foreign students to the school in order to allow participants to have interactions with people from different cultures.

One module is comprised of four sessions based on 21st Century Learning indicators, namely 1. Understanding; 2. Investigating; 3. Connecting; and 4. Integrating, to improve their skills, knowledge, and attitude. This will give participants an opportunity to learn by doing and working with peers, which will be discussed in more detail subsequently.

Layout
As mentioned previously, this program was conducted as a compulsory subject for one academic year in 2015. There were 90 minutes and twenty groups of participants for each session. At both the first and final sessions, all participants were gathered in a large room capable of holding more than 100 people; however, in the remaining sessions they were divided into 4-5 rooms.

Tools
iPads were provided for every group to use as a search engine, and as a tool for creating digital output.

Program
The details about the schedule are as follows.

Session	Global Society Society	Global Environment
Day1:Understanding	9/5/2015	7/11/2015
Day2:Investigating	27/6/2015	5/12/2015
Day3:Connecting	5/9/2015	23/01/2016 *09/02/2016 Follow up session
Day4:Integrating	12/9/2015	20/02/2016

Table3: *Schedule*

Global Society

Participants acquired a basic concept of what global society means to them.

Global Environment

Participants considered more tangible issues that are occurring and affecting this global society which they inhabit.

The following outline was used for each module for each session of the workshop.

DAY 1 Understanding

Participants will be introduced to a communication game as a basic exercise for the 21st-century skills which are communication and collaboration skills. Then, they will try to define and understand the problem of the topics discussed by brainstorming ideas with people in the group.

DAY 2 Investigating

Participants will investigate more about the topic themselves through both online research and interviews in order to find solutions. Foreign students will be welcomed to each group as both interviewees and group observers.

DAY 3 Connecting

Once all the data are gathered, participants will connect each one of the ideas in order to find insights. After that, they will create a prototype and a presentation as output [Figure 6], using iPad applications such as Adobe Spark Video (Adobe Voice) and Perstext. Through this, participants will be able to discuss and combine all of the insights they obtained to reflect what they perceived through the program.

Figure 6: *Students create a video output*

DAY 4 Integrating

All their works will be exhibited to other peers, including foreign facilitators, and peers from overseas who will also show their output to the Japanese participants.[Figure 7]

Figure 7: *Prototype*

2.3.2   EVALUATION AND DISCUSSION

At the end of every session, feedback and observations from stakeholders including facilitators and participants were accumulated and analyzed for improvements for the next module. According to the survey from students, it was shown that participants spoke positively about global-related context and this program. Also, it indicated that they enjoyed working with different schoolmates and foreigners. Nevertheless, the observation from facilitators said that although their work was finished on time, group members rarely collaborated with each other.

Also, even though the program invited a number of foreign students, and collaborated with schools in other countries, the means of interaction need to be reconsidered in order to establish value for each partner to sustainably participate.

Hence, future work will take into consideration how we can foster participants' mindsets to collaborate with each other, as well as improvement of the program with respect to interaction within local and with overseas peers.

2.4.   MONO LAB

There is a proverb that a picture is worth a thousand words. But in the context of education, the members of the Global Education

Project suggest that a making experience is worth a thousand lectures. With the rise of digital fabrication and rapid prototyping tools, the Maker movement has continued to evolve (Martin, 2015)[2], leading to an increase in Fablabs and hacking spaces in education. In addition to this, Active Learning is currently attracting a lot of attention, and Seymour Papert's constructionism is being highly valued yet again. Seymour Papert once said that the best learning takes place when the learner takes charge. His words tell us that for students, making is extremely important. Many schools are re-acknowledging the importance of making. An excellent example of this is d.school at Stanford University. The creators of d.school have not only established an innovative curriculum but have also created their own learning environments which enhance creativity and collaboration. For them, making their own learning environments or tools are simply "practicing what they teach". In other words, good educators create their own tools. From these cases we can say that, for both students and teachers, making is extremely important. That is why we created the MONO LAB. "Mono" means "object" in Japanese.

2.4.1 METHODOLOGY

Concept
In this paper we propose a new framework for teachers, in which teachers solve personal difficulties that they face in classrooms by creating tangible solutions themselves. Our study introduces and evaluates a framework for creating meaningful teaching materials for quality education, where educators define a problem from their lessons, ideate on a solution, make a prototype, and test its effect. The goal of MONO LAB is to create new learning experiences through tangible outputs. MONO LAB has three laws. First, outputs must be tangible. Second, outputs must be tested on actual target groups. Third, outputs and processes must be open to the public, so that anyone can reproduce what we have made. "Tangible" is an especially important keyword in MONO LAB.

Through the many workshops we have been conducting as Global Education for students from elementary school to high school, we know how important real environments and objects are for their learning experience. Another reason we focus on tangible outputs is because of our focus on Educational Data Mining (EDM). Current EDM gathers data through online or computer based learning, and uses that data for more quality learning. With the development of technology and Internet of Things (IoT) devices, however, we believe that we can perform the same with real classroom environments. In a sense, we are trying to perform in real life what Seymour Papert achieved inside the computer. Therefore, for students, teachers and researchers, making is extremely important. Thus, MONO LAB acts as the bridge between these three roles. Making to learn is not just for students; it is for students and teachers and researchers. In fact, it is for everyone around the world.

Activity
Up to the present, we have been working on two prototypes in MONO LAB. First is the Peeking table[Figure 8], which aims to solve the lack of collaboration during the usage of tablet devices or computers during group work research. Through the workshops that we have conducted in Japanese high schools, we have learned that few students have tablet devices to themselves, making it difficult to share tablet devices and information with other group members. The second project is the Whitebox, which proposes a new way of evaluating group work by collecting talking rates, talking volume, talking content, hand gestures and postures of the participants through Kinect V2.[Figure 9, 10] Although group work is becoming an extremely common lesson style, group work processes are often a black box to teachers. It is difficult for teachers to grasp what happens inside group work, especially when there are multiple groups to supervise at once. Whitebox looks after the activities inside groups and visualizes them after the lesson, supporting teachers in group work evaluation.

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Figure 8: *Peeking Table*
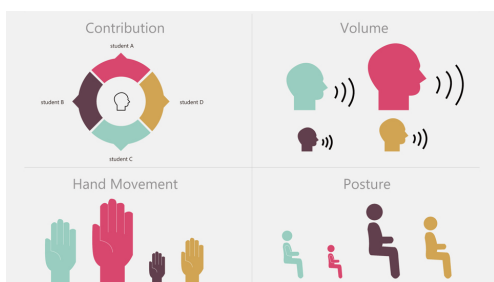

Figure 9: *White box*

Figure 10: *Visualizing data*

2.4.2 EVALUATION AND DISCUSSION

We currently have two new projects in mind. First, we hope to introduce Whitebox and Peeking table to junior high school or high school students in Japan, in order to observe how they will influence teacher and student experiences in workshops. We then will refine the prototypes from the feedback we receive. Second, we will make a platform that shares the methods and process of our device creation, so that teachers all over the world can create such tangible devices by themselves and use them in class.

3. CONCLUSION

According to the feedback from each project in this paper, it can be seen that practicing a global education program through both school curricula and extracurricular activities are widely accepted by participants, teachers, and other stakeholders. Attitudes towards a global context have also been changing significantly throughout these programs. However, there are still some obstacles to be overcome and improvements to be developed in order to create a meaningful way to nurture students' global competence.

This paper also shows that not only do students themselves need to be fostered, but also educators, who also play a critical role in these workshop-based programs, need to be prepared for the society in which education is being globalized.

With the belief that this project will broaden students' perspectives towards current society, the Global Education project has been continuing to create a sustainable program with local and foreign partners to expand in Asia and other regions, as well as developing a resource for stakeholders who will benefit from it.

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