IMPLEMENTING A COLLABORATIVE ICT WORKSHOP BETWEEN TWO UNIVERSITIES IN JAPAN AND THAILAND

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ABSTRACT

Hokkaido Information University (HIU), Japan, and Rajamangala University of Technology Thanyaburi (RMUTT), Thailand, have jointly conceived, designed and implemented a short-term exchange program for students from both institutions since 2011. Its goal is to provide students with hands-on experience working together with international partners in an Information and Communication Technology (ICT) task-based setting, and to foster an abiding global-mindedness in the participants. The program is comprised of four stages: (1) Selection, (2) Competition, (3) Collaboration, and (4) Sharing. Students taking part in the international program are selected through contests at each university that involve making ICT-based works: websites, short films and programming applications. Applicants at each university are evaluated based on the projects they complete. Those chosen at each university go on to participate in two consecutive international 8-day workshops, one held at HIU and the other at RMUTT. Teams with equal numbers of Thai and Japanese students are formed, and they work together on creating collaborative web sites, short films and computer applications. After the program, they share what they have produced and learned with their peers and instructors at each university. The program aims to develop four things in the students: ICT skills, English ability, intercultural understanding, and international friendship. The teams' projects are assessed by teachers at each university using a common rubric. By taking part in the program, students acquire personal and interpersonal skills, in addition to product, process, and system-building skills. Teachers, as well as students, are an active part of the teamwork process. As an ICT-related project-based activity that takes place internationally with English as both a second and common language, the program provides a good example of applying CDIO standards outside of an engineering context.

KEYWORDS

PBL, ICT, international collaboration, interpersonal skills, CDIO standard: 5, 8

INTRODUCTION

In this age of Information and Communication Technology (ICT), it is easy to obtain massive amounts of information from anywhere in the world. People, things and money cross the borders of countries easily, and engineers who are actively involved in their communities need to adopt global communication skills, an attitude of cooperation, the ability to act, and a sense of responsibility. By having such skills, they are able to cooperate with business partners from around the world. Developing students with these global skills is a challenge that many universities and educational institutions around the world face and embrace.

Student mobility in Europe started as the European Region Action Scheme for the Mobility of University Students (ERASMUS) program. Credit transfer is guaranteed under the provision of ECTS (European Commission, 2018) in this program. Even in ASEAN countries, student mobility has been realized under the provision of ACTS (ASEAN University Network, 2009). Taking this fact into consideration, it has been proposed that “Internationalization & mobility” should be added as an optional CDIO standards (Malmqvist, Edström & Hugo, 2017).

Hokkaido Information University (HIU) in Japan and Rajamangala University of Technology Thanyaburi (RMUTT) in Thailand have jointly conceived, designed and implemented an ICT-based exchange program for students from both institutions. The program has run annually since 2011. Its primary purpose is to foster global-mindedness and intercultural appreciation that students will take with them after graduation. International collaboration and globalization are playing more significant roles in various aspects of society and real-world systems. This program focuses especially on the flow of student mobility.

The program is comprised of four separate but interrelated stages: (1) Selection of students, (2) Competition between students, (3) Collaboration among students, and (4) Sharing by students. During the Collaboration stage, the most intense part of the program, students work in teams to conceive an ICT project; a web site, a short film, or a computer program. They continue by designing and implementing accordingly to achieve their goal. It should be noted that during the workshop phase, all students communicate in English, a second language for all of them. In taking part in the project, students need to acquire personal and interpersonal skills, in addition to product, process, and system-building skills. Furthermore, it is hoped that such skills will not only be embraced by students but also faculty at each institution. This paper presents an overview of the program and how it connects with CDIO standards.

INTERNATIONAL COLLABORATION

The program between HIU and RMUTT is titled International Collaboration. Throughout the stages of the program—Selection, Competition, Collaboration and Sharing—there are four aims, namely, that students will develop:

1. ICT-based skills
2. English ability and confidence
3. Intercultural understanding
4. International friendship

To achieve these aims, the International Collaboration program follows the original iWDC model. iWDC stands for international WEB Design Contest, and this competition was the core component of the collaborative program, with the international Short Film Contest (iSFC) and

international Computer Programming Contest (iCPC) being added several years after its inception in 2011. The complete iWDC model is expressed graphically in Figure1. From the Selection stage to the Sharing stage, the program extends over one year, with more than twenty faculty and auxiliary members from each university taking part in the project as advisors, facilitators or managers. Despite the long lead-up time, work tends to be concentrated into just a few days in the Selection, Competition and Sharing stages, with the Collaboration stage being the most demanding, resulting in a busy non-stop month for all involved, as can be seen below.

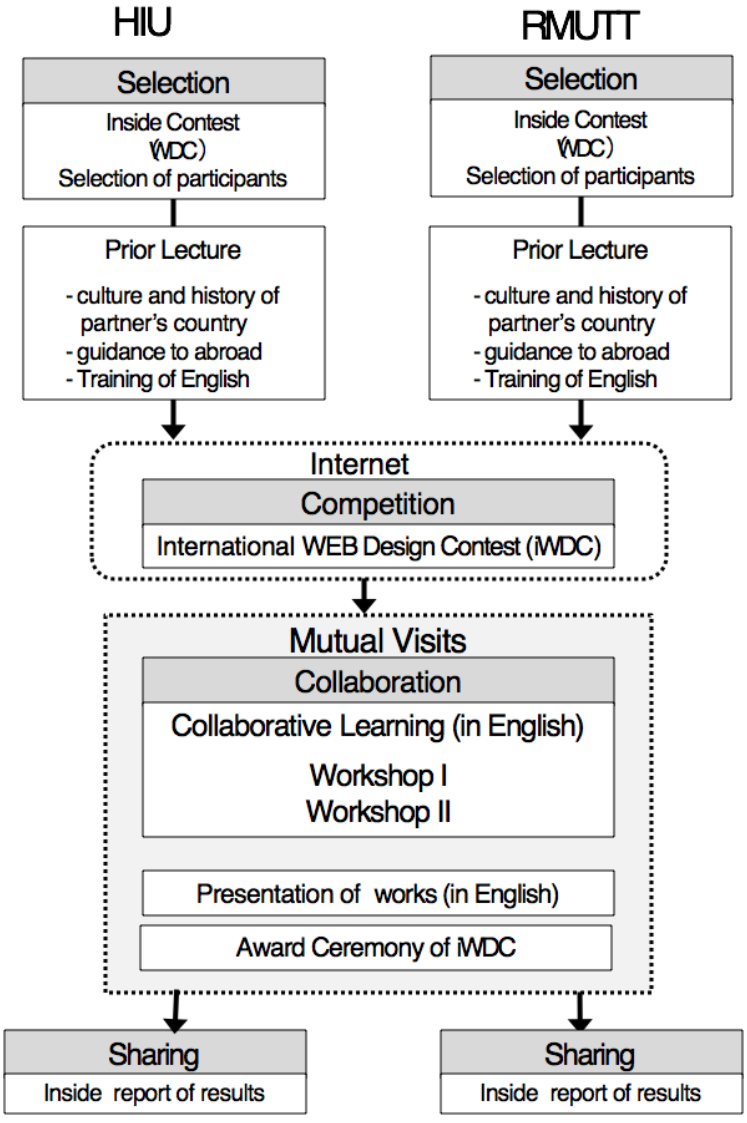

Figure 1. iWDC model

Stage 1: Selection of Participants

ICT-based project contests (Web Design, Short Film, Programming Applications) are held internally at each of the two universities. In the initial Selection stage, the aim is to select 18 students from each university and offer them the opportunity to take part in the international

collaborative program. Works to determine selection are completed by interested students in their native language outside regular lecture hours, with contest entries open from January to early May. Committees from each university evaluate applicants' finished works in order to select candidates for the international program. Students given the chance to take part in the workshop must meet two criteria; superior scores in the internal contests, and a grade point average (GPA) of 3.0 or more. The award ceremony for the 2017 ICT Contest at HIU was held in June (Figure 2a). Projects covered a broad range of topics, including such themes as "Sapporo Mystery Map" and "The Perfect Combination of Thai Food" in the iWDC (website category), "Lost page" and "Riddle Room" in the iSFC (short film category), and a "Role Playing Game" and "Gas Detection System" in the iCPC (computer programming category).

Students who meet the criteria and are accepted in the program must attend seven pre-program classes in June and July prior to the beginning of the collaborative workshops. These classes help prepare students for their international experience, and include background lectures on Japanese and Thai culture, guidance for travelling abroad—a first-time experience for many of the student participants—and practice with communicating and giving presentations in English. During these pre-program classes, students convert their projects from their native language to English in preparation for the next stage of the program, the Competition stage. It is during this stage that English as a lingua franca becomes apparent to students (Rian 2014). Figure 2b shows a pre-program class in 2017 at HIU. During the Selection stage, the initial aim is developing ICT-based skills.

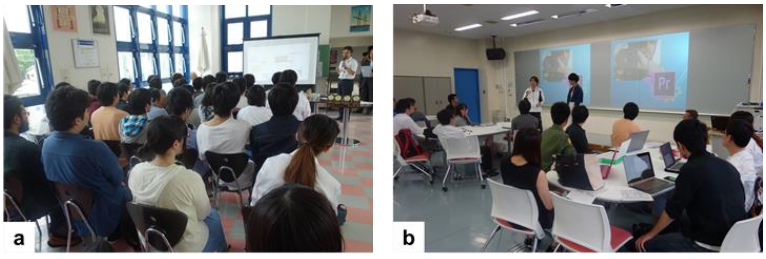

Figure 2. (a): 2017 HIU Award Ceremony, ICT Contests, June 2017 at HIU.
2(b): Pre-program class at HIU, July 2017.

Stage 2: Competition Between Students

The Competition stage, indicated in Figure 1, aims to develop ICT skills between the two universities in order to enhance students' ICT ability. As mentioned above, all student work must be translated into English. Evaluation is made by faculty members from each university who are involved with the International Collaboration program. The winners of the contests receive awards on the final day of the workshops. The presidents of both universities award trophies and certificates. During the Competition stage, students develop 1. ICT-based skills and 2. English ability and confidence.

Figure 3. Award Ceremony 2017 at HIU.

Stage 3: Collaboration Among Students

The Collaboration stage is the core stage of the program. Unlike the Competition stage, prizes and rankings are not awarded. It consists of two workshops, one held at HIU, one at RMUTT outside regular lecture hours. Students collaborate to produce ICT-related work, and work with each other over two consecutive 8-day programs, held at the respective institutions. Both the order and date of the workshops change annually, according to university needs. For the past several years, the program has accommodated equal numbers of students from each university: 18 from HIU and 18 from RMUTT. Although increasing the number of participants has been considered, 18 students from each institution is an appropriate number given necessary resource demands in terms of accommodation, support faculty and cost. While other institutions have expressed an interest in participating, increasing the scale and size of the program would currently be difficult, for the reasons previously noted.

To enable collaborative team selection, teams initially formed at each university before the workshop introduce their respective projects to one another. Based on the presentation and degree of interest, new collaborative teams are formed with members from each university. Just as the visiting order changes annually, which university students create and propose topics, and which select the team they want to join, also alternate on a yearly basis. Teachers from both universities facilitate the team formation process.

Before and after the team formation, an “ice-breaking” (meet-and-greet) session and a short lecture with program overview are given to students. The ice-breaking session is not only a chance for students to meet and become familiar with each other but also a chance to practice English communication. In the program overview, students learn about time management, and how to systematically and efficiently design and complete their projects within the time restraints. After the first 8-day workshop (Workshop I), all students move to the other university for the second workshop (Workshop II). Figure 4 shows team formation, the ice-breaking session and the program overview at RMUTT in 2017.

Figure 4. (a): meeting students, (b): team formation, (c): program overview at RMUTT (2017).

Although students are challenged by having to communicate in English during the first few days, they tend to adapt quickly. Teachers are available to help translate, but in most cases students manage to communicate on their own. A few days into the program, all teams can be seen to be working on their projects autonomously. They engage each other through their ICT skills, in addition to sharing their knowledge and cultural backgrounds. This hands-on engagement helps them develop as globally-minded people, and friendships develop between them accordingly. Figure 5a shows a snapshot of teams during Workshop I at RMUTT in 2017.

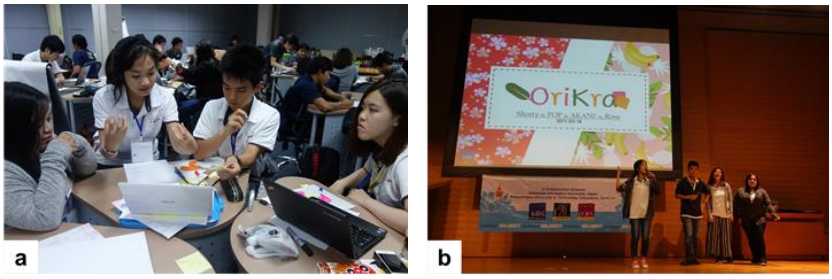

Figure 5. (a): Workshop I at RMUTT, (b): presentation of students' work Workshop II (2017).

On the final day of Workshop II, each team presents their work in English to an audience of students and faculty from both universities (Figure 5b), in addition to the award ceremony from the Competition stage also being held. In a combined meeting of faculty from both HIU and RMUTT, a comprehensive assessment of workshop learning outcomes is made for each student. On the basis of this assessment, each institution grants 3 credits to the students based on the academic equivalence standards of each institution. During the Collaboration stage, students develop (1) ICT-based skills, (2) English ability & confidence, (3) Intercultural understanding and (4) International friendship.

Stage 4: Sharing by Students

After the Collaboration stage, team works are shared with other students and faculty through presentations and reports at each institution in their respective native languages (Thai or Japanese). Audiences include non-participating students and faculty members. The international program's appeal and value can be conveyed to prospective future participants and faculty.

RUBRIC AS A TOOL FOR EVALUATION AND AWARENESS

The International Collaboration assessment committee began using a rubric to evaluate students' projects on a trial basis in 2015. Seven broad criteria are currently used in the project evaluation process: First Impression, Ideas and Concepts, User Experience, Graphic Design, Technical Skills, Volume, and Content Originality, each with detailed descriptors (see Table 1). Each criteria is further divided into sub-criteria, each with their own appropriate descriptors. Further explanation appears below.

Some of the participating students are multi-skilled, having both graphic design skills and web coding skills. Other less-advanced students team up with those who are more able, and still others, who may have poor graphic skills, use copyright and/or royalty free images to improve the look of their work. Such factors are taken into account in the evaluation process, and are reflected appropriately in the criteria and descriptors. Similarly, with respect to coding and programming technology, open-source and/or free material with various functions is readily available on the internet, and mashup technology allows students to combine those technologies to create new services. Carefully designed descriptors for each category allow accurate assessments to be made when ranking projects, and the success criteria contained therein ensure appropriate evaluations for the work of students who can, for example, write original programs from scratch as compared to those who use mashup technology.

Evaluations not only reflect the level of technical skill, but also similarly indicate the degree of graphic creativity as well as originality of content, amongst other criteria. The first impression upon opening a new web page, for example, tends to be affected by numerous variables,

ranging from function to layout to interface design. The quality of the user experience is governed by the degree and extent of interaction with the content being browsed. Experiences can vary greatly due to how compliant web sites are to multi-platform usage, allowing access from such devices as tablets, smartphones and PCs, while also being stable when viewed using any popular browser on a device running on one of several common operating systems. Participating students thus need to carefully conceive and design their work, and the quality of planning is an extremely important factor in evaluating and scoring the entries. In addition to the degree of originality, how well the concept of the work meets the purpose or target is also evaluated in the Ideas and Concepts criteria.

Table 1. Criteria of Rubric (without descriptors)

Criteria	Sub-criteria	Criteria & Score					
		Poor (1)	Min (2)	Fair (3)	Good (4)	Exc (5)	SUB-TOTAL (/15)
(A) *First Impression*	• *Impact/Impression* • *Web Site Utility* • *English Language Use*						
		Poor (1)	Min (2)	Fair (3)	Good (4)	Exc (5)	SUB-TOTAL (/10)
(B) *Idea & Concept*	• *Degree of Originality* • *Clarity of Purpose*						
		Poor (1)	Min (2)	Fair (3)	Good (4)	Exc (5)	SUB-TOTAL (/15)
(C) *Volume*	• *Text Usage* • *Image Use* • *Size/Construction*						
		Poor (1)	Min (2)	Fair (3)	Good (4)	Exc (5)	SUB-TOTAL (/15)
(D) *Graphic Design*	• *Layout & Composition* • *Expression & Appeal* • *Graphic Design Skill*						
		Poor (1)	Min (2)	Fair (3)	Good (4)	Exc (5)	SUB-TOTAL (/15)
(E) *User Experience*	• *Degree of Interaction* • *Multi-Platform Function* • *Response*						
		Poor (1)	Min (2)	Fair (3)	Good (4)	Exc (5)	SUB-TOTAL (/20)
(F) *Technical Skill*	• *Coding* • *Programming* • *Browser Compatibility* • *Degree of Completion*						
		Poor (1)	Min (2)	Fair (3)	Good (4)	Exc (5)	SUB-TOTAL (/10)
(G) *Own Content*	• *Web Content* • *Elements - photos, widgets etc*						
							TOTAL (/100)

The assessment committee has continually discussed the validity of the results obtained using a rubric as a way to evaluate student projects. The initial version was complex, and contained more than ten detailed dimensions, making evaluation both time-consuming and difficult. After several iterations, the rubric has been revised to become a more convenient and effective evaluation scale. Making the evaluation criteria available to the participants, and explaining the rationale behind the descriptors has proved useful in helping them to understand what is important when producing ICT-based work.

STATUS OF THIS PROGRAM IN CDIO

This International Collaboration program represents an adaptation of CDIO to a context where the students receive opportunities to improve skills in diverse teamwork, communication and project management. In the workshop, students go through a "conceive – design – implement – operate" process over a 1-month long program. Personal and interpersonal skills are continually developed and honed over a series of activities. Teams are formed after students describe their previous work and their own strengths to a full audience of all participants, all undertaken in non-native English [CDIO Syllabus 3.3.1]. Faculty from both HIU and RMUTT facilitate and provide support in the team formation phase. Participants take part in short lecture and practice sessions designed to help each group systematically plan and develop the project [CDIO Syllabus 4.3.4]. In addition to developing such teamwork skills, students also experience long-distance communication and cooperative learning [CDIO Syllabus 3.1, 3.2]. Employing modern technology, such as feeds, timelines, SNSs or online translation, students can easily communicate with each other. At the end of the project, final presentations are made in English by each group to an audience of other participants and faculty, utilizing appropriate multimedia and electronic aids, highlighting newly developed skills [CDIO Syllabus 3.2.4, 3.2.5, 3.2.6, 3.3.1].

CONCLUSION

This project, which grants 3 transferable credits to all participating students, promotes internationalization and the mobility of students and faculty members between institutions, as proposed by Campbell and Beck (2010). It is also in line with additional new CDIO standards proposed by Malmqvist et al. (2017). This program exposes students and faculty members to international experiences and the relevance of mobility in collaborative education. It furthermore raises awareness of working in different cultures, and helps promote effective communication strategies and skills. Additionally, participating students are given opportunities to practice and develop their English language ability in various ways: reading, writing, speaking and presenting. Just as other projects have aimed to develop internationally-minded students (Enelund et al., 2016; Koster et al., 2013; Gourves-Hayward et al., 2013; Bergman et al., 2017), our project strives to enable similar outcomes, such as understanding cultural differences, learning how to communicate in multinational teams, and a focus on English as an international communication medium. While some aims may differ, with other projects having focused on emphasizing manufacturing skills, or collaboration with enterprises, our project is characterized by encouraging long-term independent activity of students driven by short-term concentrated active learning.
The project is one of the fruits of a complementary 10-year partnership between HIU and RMUTT.

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