

## Designing Collaborative Learning Environment in Higher Education

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*Universities in Japan have recognized the need for change. The authors introduce an example of a reform program at a graduate school and describe how the new program was designed and implemented. Firstly, the authors discuss the new program from a theoretical point of view, comparing positivism and relativism traditions. Secondly, four categories of teaching and learning are introduced to explain a variety of learning. Based on the four categories of teaching and learning, the new program is equipped with six features in order to provide a rich, authentic learning environment. The authors explain in detail how the six features are applied in the new program. Comprehensive assessment should be conducted in the future on the program.*

**Keywords:** higher education, collaboration, project, learning environment, educational reform

### INTRODUCTION

Most universities in Japan have recognized the need for change and spend considerable effort on institutional change (Poole, 2003). The Ministry of Education, Culture, Sport, Science and Technology (MEXT) in Japan has also been promoting educational reform in higher education and provides grants which facilitate universities' initiation of reform programs. Since many universities apply for these grants, they are highly competitive. "Program for Enhancing Systematic Education in Graduate Schools" is one of these grants. It was started in 2007.

The Graduate School of Informatics (GSI), Kansai University applied for this grant and was accepted in 2009. Thereafter GSI began to develop a new educational program funded by this grant. The vision of the new educational program is to develop students' competency, so -called "kodo-ryoku" or "think deeply and act positively." This slogan represents the university's vision not only to develop academic knowledge, such as paper writing and presentation, but also to develop social and communication skills, such as project management, interpersonal communication, and negotiation. Translating this university vision into learning outcomes, which we call "competency", we designed and implemented a new educational program at GSI. In this paper, we describe how we came up with the learning objectives by exploring theory of learning and applying it to the new program.

### THEORETICAL BACKGROUND

In order to develop an understanding of competency, we need to review the definition of learning and to clarify what kind of learning style we value. Firstly, we compare traditional learning as objectivist tradition and new learning as constructivist tradition. Secondly, we illustrate the whole picture of designing a learning environment for graduate school.

#### Traditional Learning

In traditional education, the learner is considered a "blank slate" or an "empty vessel" waiting to be filled. Therefore, the role of the teacher is to pour information into the empty minds of learners. Modern school systems in Japan have been developed based on this concept. In this educational system, it is the teacher who decides what to teach and how to teach, while it is the students who must store knowledge in their minds. To make this system more efficient and effective, the physical arrangement of schools is organized

as follows: Suggest “a blackboard is put at the front of every classroom; the student desks are placed facing the blackboard; the teachers’ desks are placed in front of the blackboards; and students are assigned to specific classrooms by age groups. In this context, teachers talk and students listen because it is the most effective and efficient way of “transferring knowledge from teachers to students” (Hanafin & Hill, 2006).

The amount of knowledge stored in the minds of students is measured by paper and pencil examinations. Students are given set time limits and only considered knowledgeable when they have provided appropriate responses to test questions. We refer to this type of knowing as “school knowledge,” which, in our opinions, has very little, if anything, to do with real life (Duffy & Jonassen, 1992).

## Paradigm Shift

The concept of “transferring knowledge” is fundamentally embedded into the modern educational system in Japan. Traditional educational technology was also developed based on this concept, which Duffy & Jonassen (1992) called “the objectivism tradition.” Constructivism provides an alternative to the objectivism tradition. Situated cognition (Suchman, 1987), cognitive apprenticeship (Collins, 2006), reciprocal teaching (Palincsar & Brown, 1985), and distributed cognition (Hutchins, 1995) are some theories and methods of constructivism. These constructivist theories can be applied in any school setting to improve educational practice, even though the school system is not organized that way. Table 1 shows epistemological perspectives, design frameworks, and design practices (Hannafine & Hill, 2006). In this paper, the authors intentionally apply a constructivist design theory into higher education.

**Table 1.** *Epistemological Perspectives, Design Frameworks, and Design Practices*  
(Hannafin & Hill, 2006, p.54)

Epistemological Perspectives	Design Frameworks	Design Practices
<i>Positivism</i>	<i>Objectivism</i>	<i>Instructional Design</i>
- Knowledge exists	- Transfer knowledge from outside to inside of learner	- Classroom
- There is an absolute truth	- Arrange conditions to promote specific goals	- Directed - Teacher directing; learner receiving - Goal predetermined - Objectives defined - Activities, materials, assessment teacher driven
	- Knowledge engineered externally	- Products given to teacher for assessment
<i>Relativism</i>	<i>Constructivism</i>	<i>Constructional Design</i>
- Knowledge is constructed by the learner	- Guide the learner in constructing knowledge	- Environment - Learner centered
- Truth is contextual	- Provide a rich context for negotiation and meaning construction	- Teacher facilitating; learner controlling - Learning goals negotiated - Learning problems and contexts authentic
	- Knowledge constructed internally	- Activities, materials, assessment context driven and individually constructed - Artifacts shared and reflected on collectively and individually

## DEFINITION OF INSTRUCTION AND LEARNING

How do we apply a constructional design to higher education? Before answering this question, let us define instruction and learning. According to Romiszowski (1981), most practice involves some unplanned learning, while most education involves some planned, goal oriented teaching. He defines “instruction” as a goal-directed teaching process with pre-planned study as shown in Table 2.

**Table 2.** *A Definition of Instruction (Romiszowski, 1981, p.4)*

		Specific objectives exist?	
		Yes	No
Pre-planned study resources exist?	Yes	Instruction	Theatre/museum visits, study tours, library trips, etc.
	No	Projects, apprenticeships, research, etc	Incidental learning

In Table2, four types of learning are described by objectives and pre-planned resources. *Instruction* in the school setting means that teachers decide what students learn and they prepare educational resources, such as textbooks and worksheets, for students before class starts. Instruction is mostly under the teacher’s control. Curricula and educational resources are pre-planned using “instructional design.” Most school activities are organized using instructional design principles. In current school settings, this type of learning is most common.

For *theatre/museum visits, study tours, library trips, etc.*, there are no specific objectives before visiting, although theatres and museums provide rich resources for visitors. In museums, for instance, there are various exhibits (learning materials) but what students desire to learn cannot be decided beforehand.

In *projects apprenticeships, research, etc*, students consider outcomes of learning *before* the project starts. Learning materials, however, cannot be fixed for achieving the objectives. It provides more flexible activities with resources to be arranged during project activities.

*Incidental learning*, which may also be described as “enculturation”, does not include specific objectives and pre-planned resources because it is unintentional and accidental. We learn knowledge and attitudes, such as sense of values, ways of thinking, and basic beliefs, unintentionally. In school settings, it is sometimes referred to as a “hidden curriculum.” As it pertains to lifelong learning, incidental learning is the most important aspect of learning. It is difficult to clarify as curriculum because if it is planned, then it is no longer “incidental.” Incidental learning may be invisible but it is important to consider how to promote it.

According to Romiszowski (1981), instructional design can be applied to the dimension labeled *instruction*. In objectivist tradition, instructional design must be concerned with instruction, while constructional design, according to Hanafin & Hill (2006), can be applied to the other three dimensions. For example, for instructional design, teachers can set up behavioral objectives and prepare teaching materials according to the objectives. For constructional design, on the other hand, even though teachers intend to set up specific objectives for visiting museums, what students learn may be quite different from what the teachers expected. It is important to include real experiences for students in the curriculum, but it is difficult to plan these precisely beforehand. The driving force behind what students learn is their own unique curiosity and inquisitiveness. Therefore, we believe that a variety of learning styles needed to be incorporated in the new educational program. Students should design their own learning and choose learning styles which suit them. Rich, authentic learning environments need to be designed that include both instructional and constructional design processes.

## CASE STUDY

The objective of the new educational program is to design a rich, authentic, and collaborative learning environment. An explicit written description of the program at GSI, Kansai University will be produced. In order to provide a rich learning environment, the new educational program is equipped with the following six features:

- (1) *Introducing new courses*: Reviewing existing curriculum, we found it was not well balanced because it lacked the development of competencies, especially management and communication skills. New courses will be introduced into the graduate curriculum.
- (2) *Managing events, such as international conferences, international research exchanges, and guest lecturers*: The students need to be exposed to different kinds of people in order to built networks. Preparing events require students to do a lot of managerial work to make the events successful. The students also are encouraged to participate in international conferences and research exchanges.
- (3) *Organizing collaborative projects*: Collaborative research projects are at the heart of the new educational program. The projects provide authentic experiences for conducting research collaboratively. Both undergraduate and graduate students actively participate in collaborative projects and work together with people inside and outside of the university.
- (4) *Employing ICT tools, such as a project management system and e-portfolio for the monitoring of learning*: ICT tools are essential to promote activities for communicating with each other, reflecting on learning, and receiving feedback from teachers.
- (5) *Institutionalizing Preceptorship*: Preceptorship, a term commonly used in the field of nursing, means that senior students take care of junior students by modeling how to learn at graduate school. Preceptorship provides a period of practical experience and training for students. At GSI, senior students usually take care of junior students in order to model behaviors. In the program, preceptorship was explicitly introduced so that junior students can work more closely with senior students.
- (6) *Strengthening relationships with outside organizations*: To make collaborative projects successful, students are encouraged to establish strong relationships with outside organizations, such as international cooperation organizations, non-governmental organizations (NGOs) and non-profit organizations (NPOs), local schools, and others.

The six features can be fit into Romiszewski's definition of instruction (see Table 2) neatly as shown in Table 3. Instructional design can be applied to introduce new courses, while constructional design may be applied to the other five features.

**Table 3.** *Tools and Activities in the Curriculum*

		Specific objectives exist?	
		Yes	No
Pre-planned study resources exist?	Yes	New courses	International conference, international research exchange, invited lecturers
	No	Collaborative projects, Project management tools	Preceptorship , e-portfolio, Outside organizations

### Introducing New Courses

Five new courses, "Collaborative Negotiation", "Qualitative Data Analysis", "Academic English Writing", "Practicum: Project Participation", and "Practicum: Internship" opened in 2009 as credited courses. Table 4 shows the newly opened courses for the graduate students with course objectives.

**Table 4.** *New Establishment Subjects*

<i>Courses</i>	<i>Objectives</i>
Collaborative Negotiation	To learn negotiation strategies for conflict and problem resolution
Qualitative Data Analysis	To understand how to gather and analyze qualitative data
Academic Writing	To write research papers in English for submission to academic journals.
Practicum: Project Participation	To provide hands-on experience with managing collaborative projects
Practicum: Internship	To develop a fuller understanding of the structure of organizations and how they actually run day to day

## **Managing Events, such as International Conferences, International Research Exchanges, and Guest Lecturers**

In the education program, some events are organized in order for graduate students to participate, present their papers, and interact with outside people. Table 5 shows events and their objectives.

**Table 5.** *International Conference and International Research Exchange*

<i>Events</i>	<i>Objectives</i>
<i>Sponsored by the graduate school</i>	
International research seminar between Kansai University and Hanyang University, South Korea	To understand research trends abroad and to encourage collaborative research among and between universities
Seminar by outside foreign lecturers	To understand the latest research trends abroad and to encourage collaborative research
<i>Participating in conferences</i>	
International conference	To understand the latest research trends abroad and to encourage English thesis writing and presentation at ICoME, ED-MEDIA, Global Learn, etc.

## **Organizing Collaborative Projects**

The collaborative projects are self-regulated activities initiated by students and professors. The students work collaboratively with other organizations, such as the United Nations and related organizations, international aid organizations, international consultants, NPOs and NGOs, local schools and educational committees. The students are asked to plan, implement, and assess the whole process of each project.

The undergraduate students also peripherally participate in the collaborative projects. Gradually they become more involved in the activities of the projects, participating more actively and fully as their experience levels and expertise grow. This is considered a learning process.

Table 6 shows the collaborative projects implemented in the educational program. The collaborative projects have a variety of activities, which are categorized into five areas as shown in Table 6.

**Table 6. Collaborative Projects that Make a Point of Participatory Learning**

Project name	Counterpart organizations	Activities
<i>1) International cooperation</i>		
Project for improvement of teaching methods in primary education (Myanmar)	- Department of Education, Myanmar - Japan International Cooperation Agency (JICA) - IC Net	Hands-on practice and training for primary school teachers about how to apply a Child Centered Approach in their teaching
Educational cooperation project for Palestinian refugees schools (Syria)	- United Nations Relief and Works Agency (UNRWA) - Japanese professor in anthropology department	Hands-on practice and training to UNRWA school teacher together with UNRWA staff
Promoting ICT education project (Philippines)	- Bulacan State University, Philippines - Primary school teachers in the Philippines	Hands-on practice and training using ICT in classrooms at primary school together with Filipino university professors and students
Bangladesh support project (Bangladesh)	- NGO	Support Bangladesh NGO activities.
<i>2) Supporting global education for university students</i>		
Project for supporting Japanese language education in China	- Japanese language professors - Chinese university students	Supporting Japanese language education through international collaborative learning
Project for supporting Japanese cultural education in Germany	- Japanese language professors - German university students	Supporting Japanese culture and education through international collaborative learning
<i>3) Supporting global education for primary and secondary school students</i>		
Meet the GLOBE project	- Primary and secondary school teachers - Japan Overseas Cooperative Volunteers (JOCV)	Supporting international collaborative learning between students and overseas volunteers
Project for supporting international exchange learning	- Primary and secondary school teachers	Supporting international collaborative learning, integrating language learning activities, and developing learning models to promote international collaborative learning
Language Grid project	- Primary and secondary school teachers - Kyoto University	Supporting international collaborative learning using the multi-lingual translation Language Grid system
<i>4) Educational support to local organizations</i>		
Project for promoting education to develop higher order thinking skills	- Primary and secondary school teachers	Participating in seminars and lectures on developing Higher Order Thinking skills
Project for promoting multimedia resources utilization	- Primary and secondary school teachers	Participating in seminars and lectures on promoting multi-resource utilization
Project for producing video for science education	- Primary and secondary school teachers	Developing teaching materials for science education
Project for supporting ICT education in high schools	- Secondary school teachers	Hands-on practice using ICT for the high school subject Information Study
Project for teaching computer to elderly people	- Community center	Providing lectures for basic computer skills for elderly people
Project of teaching basic ICT skills for hospitalized children	- Osaka University affiliated hospital - NPO	Introducing ICT to children who are in the hospital
<i>5) Curriculum development for graduate school</i>		
Project for designing web-based communities	- Outside advisors	Developing learning communities using Web 2.0 tools (e.g. e-portfolio, Learning Management System)

## **Employing ICT Tools, such as a Project Management System and E-portfolio, for Monitoring of Learning**

The project management system (PMS), called “Basecamp”, is introduced to facilitate communication among project members. The PMS particularly helps with sharing information, such as documents, photos, spreadsheets, schedules. The information can be shared among project members and with other students who are involved in different projects. The PMS makes the project activities visible to other people so that they can monitor and compare projects.

The e-portfolio, called “Mahara”, is employed to record activities of the collaborative projects as well as independent learning. The e-portfolio allows students to reflect on their learning and it is also used for assessment by professors. The e-portfolio is particularly useful for students who go abroad to work on international projects. The professors can monitor on a daily basis what students are doing for the project because they are required to report everyday.

## **Institutionalizing Preceptorship**

At the beginning of the spring semester, both graduate and undergraduate students participate in the “kick-off” camp at a seminar house. In the camp, a participatory workshop is conducted to allow students to get to know each other and to familiarize them with the cultures involved in the international collaborative projects.

*Meetings for project leaders* are conducted periodically to share the progress of each project. *Debriefing sessions for collaborative projects* are held twice a year to share project outcomes. Both graduate and undergraduate students participate in these sessions to better understand the other project’s activities. In the process, senior students begin to mentor junior students informally.

## **Strengthening Relationship with Outside Organization**

To promote the educational program, the GSI attempts to strengthen relationships among various sectors and organizations, inside and outside of Kansai University. Table 7 shows these sectors and organizations. Outside organizations shoulder the responsibility of providing various specialties that Kansai University cannot offer. This type of collaboration promotes a more comprehensive involvement among all project participants.

## **CONCLUSIONS AND FUTURE PERSPECTIVE**

In the previous educational program of GSI, students had difficulties connecting what they learned with what they actually did in their fields. This is because the requirements of the educational program were not clearly explained to students causing them to be unsure of what to accomplish in their graduate programs.

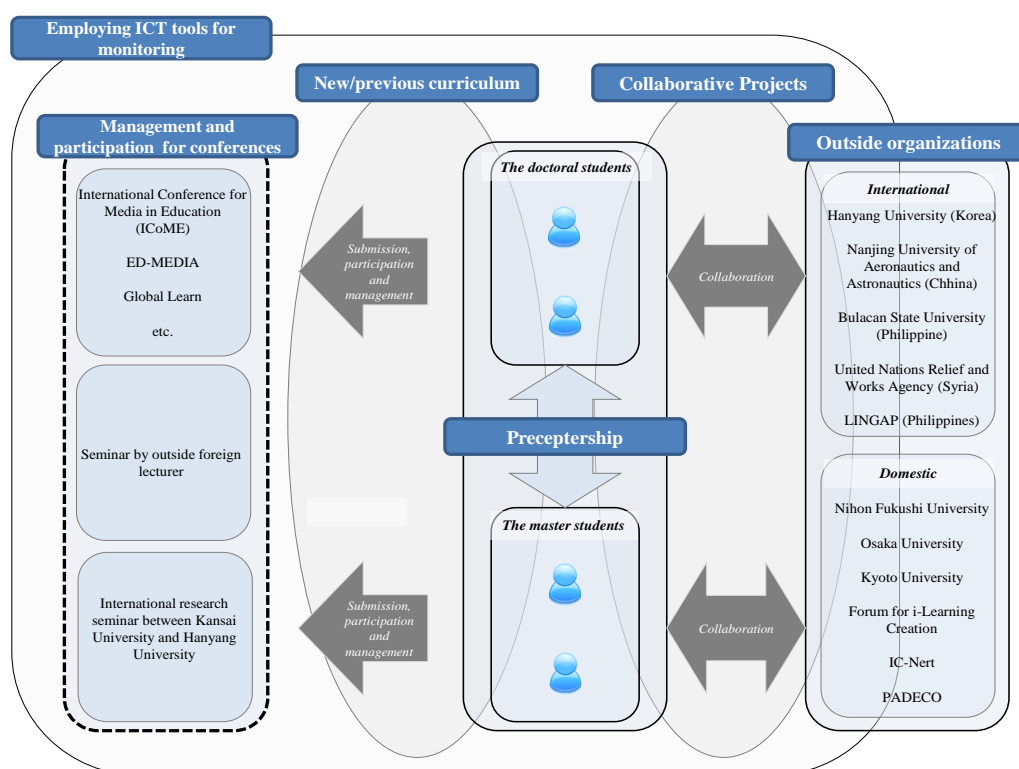
**Table 7. Collaborated Sectors and Organizations**

Inside sectors	<ul style="list-style-type: none"> <li>- Division of International Affairs</li> <li>- Information Technology Center</li> <li>- Center for Human Activity Theory</li> <li>- Division of Community and Business Partnership</li> <li>- Faculty of Foreign Study</li> </ul>
Outside organizations	<p><i>Universities</i></p> <ul style="list-style-type: none"> <li>- Osaka University (Japan)</li> <li>- Kyoto University (Japan)</li> <li>- Nihon Fukushi University (Japan)</li> <li>- University of Hawaii (USA)</li> <li>- Hanyang University (South Korea)</li> <li>- Nanjing University of Aeronautics and Astronautics (China)</li> <li>- Bulacan State University (Philippines)</li> <li>- Yankin Education College (Myanmar)</li> </ul> <p><i>NGO/NPO</i></p> <ul style="list-style-type: none"> <li>- LINGAP (Philippines)</li> <li>- House of Joy (Philippines)</li> <li>- Forum for i-Learning Creation (Japan)</li> </ul> <p><i>International cooperation agencies</i></p> <ul style="list-style-type: none"> <li>- United Nations Relief and Works Agency (Syria)</li> <li>- Japan International Cooperation Agency (Japan)</li> <li>- IC-Net, an international cooperation consultant (Japan)</li> <li>- PADECO, an international cooperation consultant (Japan)</li> </ul>

Figure 1 shows an overview of the new educational program of GSI, including the six strategies. In the new program, the students can get opportunities for integrating theories that they will learn in the *new courses* and *collaborative projects*. Firstly, the collaborative projects with the *outside organizations* provide authentic situations through which the students can learn. Secondly, the *preceptorship* in the collaborative projects fosters communication among the students. The junior students learn how to manage in the collaborative projects and how to write up a research paper based on the data collected in the projects. The senior students also can gain opportunities to reflect on interactions with the junior students through preceptorship. Both students are encouraged to write up and submit their research papers about their projects to *international conferences or research exchanges*. The students can get a variety of feedback and advice from other participants. In the collaborative projects, students produce an *e-portfolio* for reporting to the faculty and self-reflection. The faculty members monitor students' learning progress and outcomes from their e-portfolios and give feedback as necessary.

We have not conducted summative assessment of the new program yet because the program only started in 2009. However, we conducted formative assessment of the new program as new courses and activities were implemented. We strongly believe that the new program positively impacts students. We plan to conduct more comprehensive assessment in the future. This study is the mid-term report of the new educational program.





**Figure 1.** Design of 6 strategies of the new educational program that were installed to GSI

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