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From Competency List to Curriculum Implementation: A Case Study of Japan's First Online Master's Program for E-Learning Specialists Training

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This article describes the creation of a fully online master's program for e-learning specialist training. This program is the first of its kind in Japan. As background information, Japan's general trends in e-learning are described, including activities of the e-Learning Consortium Japan and National Institute of Multimedia in Education. Such features of the master's program are then introduced as core and optional competencies for graduates, curriculum design, course design policy, and learning portal design. Since the core of the program is instructional design and the program deals with e-learning not only as the means of delivery but also as the content area of training, this online master's program may be considered unusual. Nevertheless, the lessons learned in this case and associated implications for other program development are important to others building similar online programs.

Introduction

For decades now, Japan has been known as an industrialized and information technology oriented country. Ironically, as far as e-learning is concerned, it has not been a world leader or even a leader within Asia alone. Using indexes in four categories (education, industry, government, and society) with four criteria (connectivity, capability, content, and culture), the Economist Intelligence Unit (2003) ranked Japan's e-learning readiness 23rd among the world's 60 largest economies. In the same report, South Korea was ranked 5th, Singapore 6th, Taiwan 16th, Hong Kong 19th, and Malaysia 26th among Asian countries. A more recent ranking of e-readiness (as opposed to e-learning readiness of mentioned above), positions Japan at 18th of the

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largest 70 economies (Economist Intelligence Unit, 2008). Although some reports have described e-learning and blended learning trends in Japan (Jung & Suzuki, 2006; Visser & Suzuki, 2007), much is still unknown in the professional literature as to why e-learning in Japan may have been delayed as well as what trends are currently underway.

The E-Learning Consortium Japan (eLC: http://www.elc.or.jp/), which was established in 1996 as the Technology-Based Training Consortium, is Japan's major non-profit organization among e-learning vendors and users (87 member firms as of Oct. 2008). eLC has monthly meetings among members, hosts an e-Learning World (Conference/Expo) every summer and an e-Learning Conference every winter. In addition, it has translated much discussed SCORM (Sharable Content Object Reference Model) standards into Japanese and conducted associated SCORM validation tests. It also publishes e-learning related books, including a well known e-Learning White Paper in 2007. Finally, in 2008 it started e-Learning Professional (eLP) Certificates.

While eLC has been leading e-learning business scenes in Japan, the National Institute for Multimedia in Education (NIME: http://www.nime.ac.jp/en/) has been the center of e-learning for Japanese higher education. Established as an MOE inter-university research institute before becoming independent in 2004, it serves ICT (Information and Communication Technology) in higher education. NIME has been active in creating aggregated cross-website searches (130,000 cases) called NIME-glad (Gateway to learning for ability development), which added federated search with ARIADNE and MERLOT. In collaboration with Global Learning Object Brokered Exchange (GLOBE), it has been expanded with education.au.limited and LORNET. NIME has also published *Annual Reports of ICT in Higher Education* as well as the peer reviewed *Journal of Media in Education*. In addition, it has conducted international seminars, provided workshops for the training of teaching staff in ICT, and developed and offered e-learning courses in remedial education and various graduation competencies. It was recently announced that NIME will be merged with the Open University of Japan in March 2009.

According to *Annual Report of ICT in Higher Education* published by NIME, the overall rate of e-learning introduction among Japanese universities was 51% in 2007 (NIME, 2008). However, only slightly more than 20% of the universities are conducting e-learning courses for credits. Even after adding those institutes that are planning on offering credit-based e-learning (4.4%), there is but a quarter of Japanese universities that are offering or planning to offer e-learning courses and programs. Compared to the penetration rates of universities in other countries, the penetration of e-learning in Japan is still very low.

Online Master Program in Instructional Systems

Japan's first 100% online program for e-learning specialists focused in corporate and higher education, the Master of Science program in Instructional Sys-

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tems, started in April 2006 at Kumamoto University. As the first attempt to add a fully online program to an on-campus university with more than 100 years of history, there was a decision to train e-learning professionals emphasizing four areas of expertise. The four I's, representing the main emphasis areas of the program, are as follows: (1) instructional design (ID), (2) information technology (IT), (3) instructional management (IM), and (4) intellectual property (IP). It is a regular on-campus equivalent master's program that requires two years of study and a minimum of 30 credit hours of courses. Twelve courses are required to complete the master's program, whereas 16 elective courses are offered from which four or more courses need to be taken to complete the degree.

It was planned to be a fully online program for several reasons. First, the program is targeted for working professionals who require flexibility for them to enroll while working full-time. Second, Kumamoto University is located in the south-most island, whereas the demands for such a program are in major cities such as Tokyo or Osaka, not in Kumamoto. For an institute located far from major cities, online learning was the only choice to obtain enough students. Third, the Japanese government regulation had been changed to allow a 100% online graduate program, not as a correspondence program, but as a regular program that is equivalent of an on-campus program through use of advanced learning technologies which make interactions possible on a regular basis. And fourth, e-learning professionals should be able to be trained via using e-learning systems to show them how various e-learning components can be used.

The program was launched in April of 2006 with 15 first year master's students, after being selected through rigorous admission process that started with 37 candidates. All of the admitted students were professionals in their 30's and 40's, working full-time in various locations: ten living in Tokyo, two in Osaka, and the rest in Kyushu Island where Kumamoto University is located. As of April 2008, the enrollment in the program was 49 degree seeking (including 4 in the online doctorate program) and 34 non-degree seeking students.

A quick learner analysis revealed that they are mature students, studying alone at home or offices, capable of conducting independent study via the Internet. Minimal faculty support would be required. In addition, encouraging collaboration and learning from each other would be an effective instructional strategy that allows them to utilize their diverse professional backgrounds. Since they are working fulltime, time management may be an issue; hence, the asynchronous mode of learning seemed to the most flexible learning environment for these busy professionals.

Overall Design of the Program

Figure 1 describes the overall design of the program created based on ID methodologies. Inputs are listed on the top of Figure 1, which included the 4 I's concept, list of courses, and governmental requirements to be regarded as equivalent of on-campus program (15 interactive synchronous/asynchronous

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sessions). Case studies, indicated on the bottom of Figure 1, were conducted to locate and examine advanced online programs, including the instructional systems programs at Florida State University, the Open University of U.K., and Carnegie Mellon University's West Campus. Also taken into consideration was a movement of eLC to establish eLP Certificate Program. An early draft version of eLP's competencies for seven kinds of certificates were obtained so that our program could be aligned with what Japan's prominent professional alliance in the field of e-learning had to offer to certify their professionals. When eLC started its eLP certificates in 2008, our program became one of the two authorized institutes to certify eLPs: except for the Tutor Certificate, all other six kinds of certificates could be obtained by taking specified courses in our programs: Learning Designer, Manager, Expert, Contents Creator, Consultant, and SCORM Engineer Certificates.

Based on these inputs and consideration of future trends for our prospective graduates, a list of competencies was created and made public in January 2006. Course design policy was agreed upon among core members of the program, on which each of the course syllabi was drafted and coordinated through workshops among the core members. A learning portal was then designed and created to link the university's single sign-on user identification to the learning management system (LMS; in particular, WebCT CE6), as well as to pro-

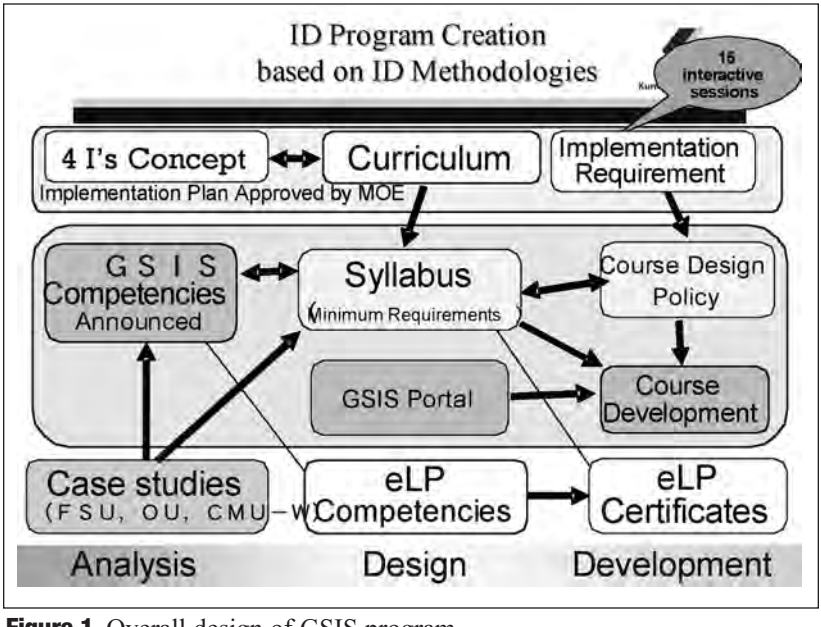

Figure 1. Overall design of GSIS program.

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vide learning assistance for the students. Each of the course contents was then created based on the course design policy, before the implementation of the program. Each of the outputs is to be described in the following sections.

Core and Optional Competencies for Graduates

Table 1 shows core competencies, whereas Table 2 shows optional competencies for graduates. The core competencies list 12 capabilities that would be developed by taking required courses of the program. They cover the basic capabilities in the field of ID, IT, IP, and IM – the four I's emphasized in the program. All the assignments in the required courses are mapped with one of the 12 competencies, which represent basic knowledge and skills of e-learning professionals. When each of the assignments is accomplished by a student, a mark indicating the assignment will reverse the color, thereby showing accumulating status of a competency by completing the assignment.

By explicitly showing the competencies, the students, current and prospective, will be notified with our expectations for the students. It shows the boundaries of our expectations: for example, for IT related competencies, all the graduates are expected to become able to design effective, efficient, and appealing learning contents by utilizing functions provided by an LMS (Core

Table 1
Core Competencies for Graduates

By completing this program, you will acquire a basic level of the following competencies:
1. To analyze the status quo of education and training practices, by referring to the fundamentals of instructional systems research.
2. To describe and interpret e-learning success and failure cases in various domains and areas.
3. To create a course development plan and conduct a persuasive proposal based on various viewpoints of stakeholders.
4. To design effective, efficient, and appealing learning contents by utilizing functions provided by an LMS.
5. To develop a prototype of active contents executable on a Web browser.
6. To implement a course development project as a team leader.
7. To evaluate and suggest improvements for an implemented project or a developed course.
8. To propose strategies for educational services and businesses based on HRD strategies or market needs.
9. To recognize and solve legal and ethical issues in networked environment.
10. To watch latest advancements in instructional systems field and apply them in professional activities.
11. To disseminate findings from own practices through professional activities thus contribute to society.
12. To contribute to improvements and advancements of the program as an alumnus.
Note: Announced in Jan. 2006 at http://www.gsis.kumamoto-u.ac.jp/outline/

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Table 2
Optional Competencies for Graduates

By taking optional courses in this program, you will acquire a basic level of the following competencies:
1. To set up, manage and utilize a server for e-learning and to develop a prototype of active course contents by utilizing server-side applications.
2. To develop courses and manage systems that meet requirements of e-learning standardization and inter-operatability.
3. To create a safe e-learning environment in terms of network security.
4. To propose management resolutions from the viewpoints of knowledge, information, and learning.
5. To discuss with subject matter expert in a specific area based on its own instructional characteristics.
6. To propose and support implementation of educational services and products as a consultant.
7. To propose establishment, improvement, and change in e-learning policies for own organization and customers.

Note: Announced in Jan. 2006 at http://www.gsis.kumamoto-u.ac.jp/outline/

Competency 4), and to develop a prototype of active contents executable on a Web browser (Core Competency 5). However, to become able to develop a prototype of active course contents by utilizing server-side applications, learners need to take one or more elective courses (Optional Competency 1).

It was our thought that all of our graduates should have experiences of actually developing a course segment, so they would have acquired an ability to talk with developers of e-learning contents, although not many of our graduates would actually engage in the development of contents as programmers. The term *prototype* is thus used in the statement of the competency, representing the minimum requirement for the skill or competency.

Course Design Policy

Based on our audience analysis, governmental regulations, and general grading policy of the University, a set of course design policies were established as shown in Table 3. First of all, the asynchronous delivery mode was decided to be the main method of interaction through the use of WebCT's quiz function, report submission function, and Bulletin Board System (BBS). Instead of having deadlines once a week, our policy states the 15 required interactions to be clustered to have two or more tasks due on the same date (Policy 4). This was introduced by taking into account the fact that each of the students would enroll in four or five courses each semester. If due dates are set for every week, then each student would need to handle tasks for four or five different courses simultaneously. By having them clustered, a student would

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Table 3
Course Design Policy

1. Fifteen (15) interactive sessions in each course with evidences, e.g., quiz, mini-report, answer to practice exercises.
2. Course grades based on multiple reports/products with the record from 15 sessions, each requiring the minimum of 60% for a passing grade.
3. Direct connection of course assignments to the competencies.
4. Due dates of 15 session tasks to be clustered into 3-5 blocks to enable learner's intensive study.
5. Limited synchronous whole class activities (maximum of twice a semester per course).
6. Students commenting each other's reports/products for improvements before final submissions.
7. Introductory video message in all courses or all blocks of a course as a motivator, not as a primary mode of information provision.

be allowed to finish several weeks' worth of tasks of one course, before moving to the tasks of a different course.

To encourage interactions among our students, Policy 6 was introduced (Table 3). By using BBS's functionality for threaded discussions, a student would be asked to post a message with her draft proposal as an attachment. Other students, after posting their own drafts, are encouraged to review the classmates' drafts, after which they could make any comments as a reply to the original messages. It is after such interactions among the students that their final proposal would be turned in by using WebCT's report submission function. Points are allocated according to online contributions such as making comments to the drafts of peers. Such a grading tactic signals to students that interactions among peers are highly valued.

Original Learning Portal Site

A learning portal site was designed and developed to help our online students. It was designed to connect the University's sign-on site to our LMS (WebCT) in such a way that the portal would serve for time management of our students, as well as a portal to various resources including University's digital library and course registration service.

Figure 2 shows a screen that provides a monitoring function for all the courses a student is concurrently taking in a semester. In particular, this student was taking five courses, after finishing an orientation shown on the bottom. Each course has direct links to 15 tasks in the upper portion, and several assignments in the lower portion of a horizontal scale. By moving the mouse over to each of the buttons, due dates and starting conditions are indicated in mouse pop-up windows. Each entry due date is marked by colors:

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Figure 2. Monitoring progress in all courses (GSIS portal).

overdue in red, due within a week in pink, accepted in yellow, available tasks in green, and not yet available tasks in gray. Evaluation status is also shown as either passed (yellow), resubmission required (orange), or grading in progress (blue). It was our intention that by providing such an overview for each of the students, they would have better control in managing time for study without needing human assistance.

Lessons Learned and Implications

The initial design process and outputs for the program took much planning and deliberation. It was our intention to utilize what we know about instructional design to create our own learning environment for the fully online master's course for the working professionals. The development of course contents were done according to the course design policy, while designing the next chunks of course contents, just ahead of our student progress. Minimum requirements for clearing assignments in every course were highly maintained. Although resubmissions were required when necessary, student reactions in course evaluation were positive.

Despite these policies and procedures, the graduation rate of the first cohort in two years remained lower than 50% (7 out of 15). Those who did graduate, however, wrote high quality master theses. In addition, their self evaluations of core competencies were high. Among those who did not complete their degree in two years, one completed it in 2.5 years and another is expected to finish by the end of third year. At the same time, one student had to resign due

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to health reason, two lost contact, and the rest are moving ahead slowly, but steadily. In reflection, it was not realistic to expect that all of our students would finish in the minimum duration while working full-time. Given the population the program is serving, the more strict the competencies and passing criteria for assignments, the more difficult the program becomes to complete. We feel that we need to monitor closely how our students feel about our policy and what they are getting from our program. If our students regard their experience to be valuable and applicable to their professions, toughness may not be bad from the standpoint of quality assurance of our program.

This online program may be considered more sensitive to certain design components since the core of the program is instructional design where the focus is on the effective design and delivery of instruction. In addition, it is unusual since the program deals with e-learning not only as the means but also as the content area of training. Nevertheless, similar processes may be applied when creating online programs in different disciplines and subject areas. We have taken great pains to practice what we teach in our curriculum. As a result, we may have produced courses which over applied instructional design principles compared to normal courses in higher education. At the same time, such strict adoption of instructional design principles and practices used here can be benchmarked by others. Hopefully, our practices can help simplify ways of adoption of e-learning for others. We hope that can not only follow in our footsteps, but can lead well beyond them.

There have been many ID models proposed as of today, some of which have been considered in renovating our program toward the third cohort starting in April of 2008. MOE Japan's Grant related to Innovative Educator Training Program for the IT Area has been awarded to us to reform our program to be a story-centered curriculum (Schank, 2007). Such a curriculum should be more interactive and relevant for working adults. Additionally, the Japan International Corporation Agency has agreed to support international students within our program by converting necessary course contents into English. In the midst of these changes, at the completion of the first master's cohort, a doctoral program was approved. In order to maintain and improve what has been accomplished to date, continuous examination and additional reforms will be undertaken. With all these supports and new initiatives, this is quite exciting!

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Notes

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