Upgrading an online master's degree program based on Story-centered Curriculum (SCC): A case study

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Abstract: This paper describes a case study of upgrading an existing online master program based on Story-centered Curriculum (SCC). After a completion of two year implementation of Instructional Systems Program at Kumamoto University, Japan, SCC was introduced to build cohesive structure to the entire curriculum. The reform was carried out by analyzing existing course assignments, re-arranging the sequence of study by specifying weekly work orders, and creating an overarching story and characters that covers all the required course assignments. An SCC skin to be added to existing learning portal site was then designed and developed that provides weekly orders, explanations as to how course assignments are related to the work orders, and links to the course materials. Eighty-nine percent of the students completed the first year of SCC, majority of who expressed positive reactions to their experiences. Lessons learned are described with implications to other similar efforts.

Introduction

Kumamoto University's Instructional Systems Program is an online independent master's program founded in April 2006 as Japan's first graduate program to train e-Learning specialists through e-Learning (Suzuki, 2007). Although Kumamoto University is an on-campus university with about 10,000 students and 1,000 faculties in 7 colleges and 9 graduate schools, founded in 1887, Instructional Systems Program was created as its first 100% online program. It is one of the University President's direct projects to seek possibilities of e-Learning, thus has an experimental nature. As of April 2008, it has 49 degree seeking (including 4 in doctorate program) and 34 non-degree seeking students, scattered all over Japan, mostly working full-time in corporate training or higher education settings. Since the program has an experimental orientation and since one of the core disciplines is instructional design, it was decided to reform the program at the completion of the first two years by applying the latest of instructional design theories. A Graduate School Good Practice Grant from MOE Japan helped such a reform effort financially.

Story-centered Curriculum (SCC) is an extension of Roger Schank's instructional design theory called Goal-based Scenarios (GBS). Whereas GBS is a model for designing simulations for learning higher-order skills by doing and making mistakes in a virtual environment (Schank, 1996; Schank, *et.al.*, 1993-4; Schank, *et.al.,* 1999; Nemoto & Suzuki, 2004), SCC is to be used for curriculum-level design by providing an architecture for higher scalability without loosing the learning by doing nature of GBS (Schank, 2007). SCC unites multiple courses, usually taken concurrently within a given semester, by introducing first a cover story from a real-world situation common to multiple courses, in which graduates of a program would be expected to work as professionals. Within such an authentic context, the students would act as if they were already in such a situation, but with assistance and information from faculty when needed. SCC sets a structure for low cost implementation, as compared to GBS, by (1) using low-end media selection such as e-mails and video clips on Web, rather than high-end branching digitalized video-based scenarios, (2) incorporating existing resources available online, or in textbook format, and (3) relying on professor (and/or tutor/peer)-student interactions, rather than preprogrammed-for-all-possibility sequences of computer-student interactions.

SCC has been successfully implemented by Schank and his colleagues at Carnegie Mellon University's software engineering and e-business curricula at the master's level (Schank, 2007). Although these cases have been widely known, no other SCC-based curricula have been implemented by a third party and/or in other cultural contexts. Whereas those existing cases were to create SCC-based curricula from scratch, no case has been reported to apply SCC for reforming an already existing program (Suzuki, *et.al.*, 2008).

The purpose of this study was to describe lessons learned from an upgrading effort of an existing online master's program using SCC to achieve cohesive structure across multiple courses. It was expected that the reform effort could be accomplished by a third party, the authors of this paper, in a limited resource environment by making the best use of the existing course materials, as compared to the previous cases that had six to twelve months of leading preparation time to create the entire program from the scratch by the originators of the theory. It was also expected that such a reform would be welcomed by students with diverse backgrounds, as well as by professors involved in offering the courses, produce better quality student products in combined courses, and reduce delays in completing course assignments.

Analysis of Existing Course Assignments

The SCC team, consisting of the authors of this paper, first started analyzing assignments of the existing courses. Instructional Systems Program was originally created with a clear image of graduates working as professionals in e-Learning related fields, in a form of 12 core competencies (Suzuki, 2007). All the assignments in required courses are set around those competencies. Each of the required courses has multiple assignments each related to one or more competencies and assigned to one of the multiple blocks within the course. Each block has different length, ranging from three to twelve units of a 15 unit course. As course development policy of the program, no course had the final examination, all grades are determined by multiple assignments specified in each course, and all assignments have clear passing criteria, with multiple chances of submission if the first trial was shy of meeting the criterion.

The end product of this phase was a diagram showing sequential relationships among all the assignments (See Figure 1). It was originally specified which course was a prerequisite to the more advanced courses when the curriculum was first built. However, based on the analysis of all assignments, dependency of prerequisites was nailed down from the level of the courses to the level of assignments, which made different sequencing of the courses possible. For example, "IT Basics" is a prerequisite to take "ICT Systems for Learning Support (ICTSLS)" in the existing curriculum, and within ICTSLS, all assignments are to be taken in the specified order. However, based on the analysis, Assignment 1 and 2 of ICTSLS are needed to be completed in time for "e-Learning Practicum I", but Assignment 3 of ICTSLS can be done without going through Assignment 1 and 2 of ICTSLS. Instead, Assignment 3 of ICTSLS can be placed in the 1st semester, as an introduction to IT aspect of design, if "IT Basics" is completed as a part of orientation prior to the start of the 1st semester.
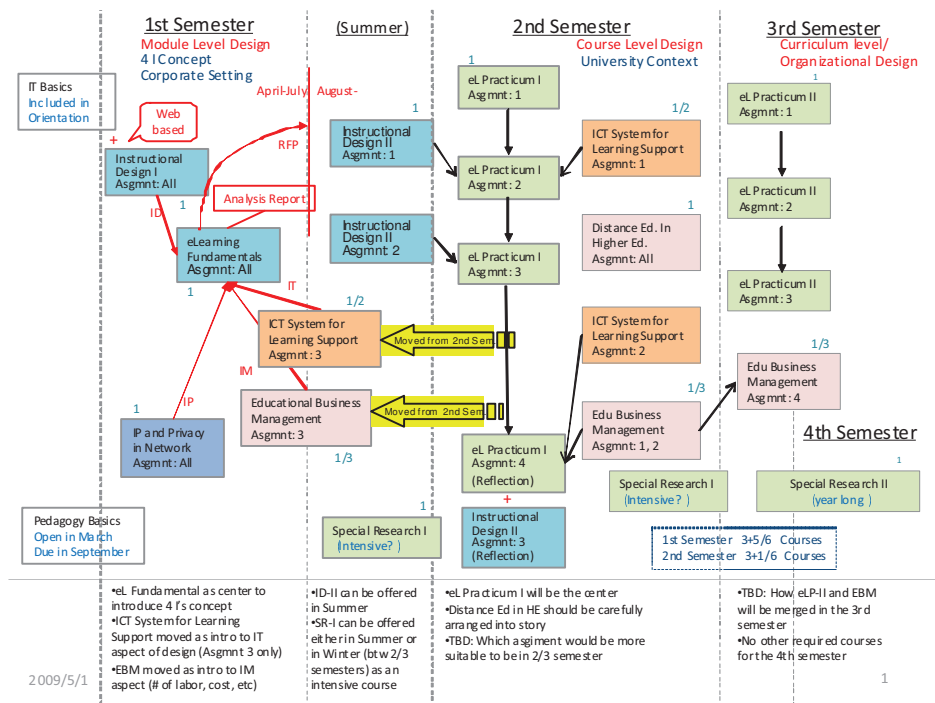
Figure 1: Mutual Dependency of Course Assignments

Re-arranging the Study Sequence

Based on the dependency analysis of the course assignments, study sequence was designed. One of the main characteristics of SCC is that the students, who are taking multiple courses concurrently within a given semester, will work on a single assignment at a time. It can be done because multiple concurrent courses are merged together to form a cohesive sequence of study under a single story line. It is therefore important to chunk assignments from various courses, which may be different in sizes, to a similar quantity of assignment. We adopted weekly assignment as a basic unit, which may be equivalent of four-week assignment of a single course. Because a student is normally taking four required courses simultaneously, each week would be spent one forth of assignment in each of the four courses. So, since one particular week would be allocated to a single course within the SCC framework, it should have a quantity of four week workload to cover as same amount as a non-SCC coursework.

It is also considered if any required courses that are not taught in the first semester should be moved to the first semester, in order for the first semester to become better represented as the initial contact of our program. Based on the fact that the Instructional Systems Program has the concept of 4I's, namely, instructional design (ID), information technology (IT), intellectual property (IP), and instructional management (IM), some parts of the courses originally offered in the second semester were decided be moved to the first semester. In that way, it was expected that the overarching story would cover the entire 4I's that represents what the program has to offer as the basis of e-Learning professionals.

Figure 2 shows the result of the re-arrangement of the study sequence, comparing before and after introducing SCC. The top half represents curriculum before the introduction of SCC, where multiple courses, each divided into several blocks based on the number of assignments, are to be taken concurrently. By introducing SCC, which is shown in the bottom half of the figure, each of the 15 weeks in the first semester is to be devoted to only one of the required courses. Some of the course assignments are allocated two weeks (e.g., Block 2 of Instructional Design I to Weeks 6 and 7), due to the magnitude of its assignment, but mostly one assignment from a course for each week. Note that three assignments of two courses (ICTSLS and Educational Business Management) are allocated in the first semester (Weeks 12-14), by moving them from the second semester. It was decided to represent IT and IM of the 4I's respectively.
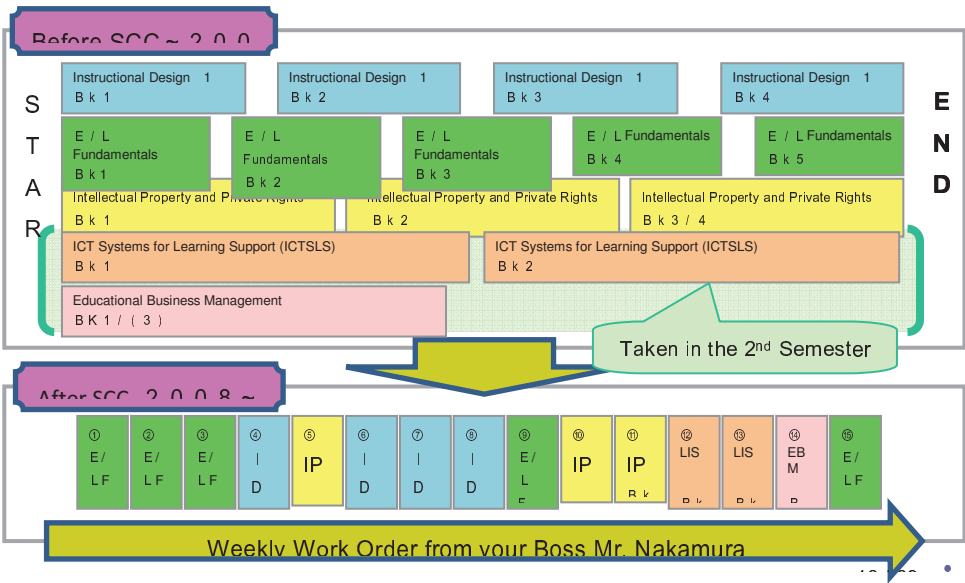
Figure 2: Weekly Study Sequence of the 1st Semester: Before and After SCC

Overarching Story and Characters

Based on the sequential dependency of the existing assignments and re-arranged study sequence, a cover story was depicted that covers all components in the first semester. Table 1 shows a synopsis of the cover story. It was decided to borrow from a business setting, rather than higher education setting, to create the first semester's cover story, because the majority of our students are from corporate settings and because e-Learning in corporate settings seemed to be more advanced than that of higher education. It was thought that knowing scenes of corporate scenarios may benefit to not only those who are working in corporate settings, but also in higher education by experiencing more advanced examples.

Table 1: Cover Story for the 1st Semester

In April 2008, you joined Meet-The-Mind (MTM) Co. as a planner/designer of e-Learning Contents Development Unit. Your immediate boss is Mr. Nakamura, who has not trained in instructional design, but has management background.   (omitted)

You are given Mission to complete within 15 weeks, by Mr. Nakamura as follows:
1) To establish quality standard of e-Learning products.
2) To propose strategic plan for a new product.
3) To propose new business line capable of starting a new Unit related to e-Learning.

Figure 3 represents the setting for the cover story and characters or stakeholders within the story. It was decided to describe our program (Kumamoto University in Figure 3) as a partner of the hypothetical company, Meet the Mind (MTM), Co., which offers training/consulting to the newly hired employee (the students him/herself). Thus, the work order would come from your boss, Mr. Nakamura, the director of Contents Development Unit, whereas the training that is useful to accomplish the Mr. Nakamura's weekly work order would be provided by the university. As the weekly scenario develops, various business partners of MTM, Co. will bring issues associated with their business for Mr. Nakamura, who in tern give the student various work orders. All the weekly work orders have some aspect to build up for a contribution to the mission given in the cover story (see Table 1), as well as some relationships to assignments in the existing required courses.
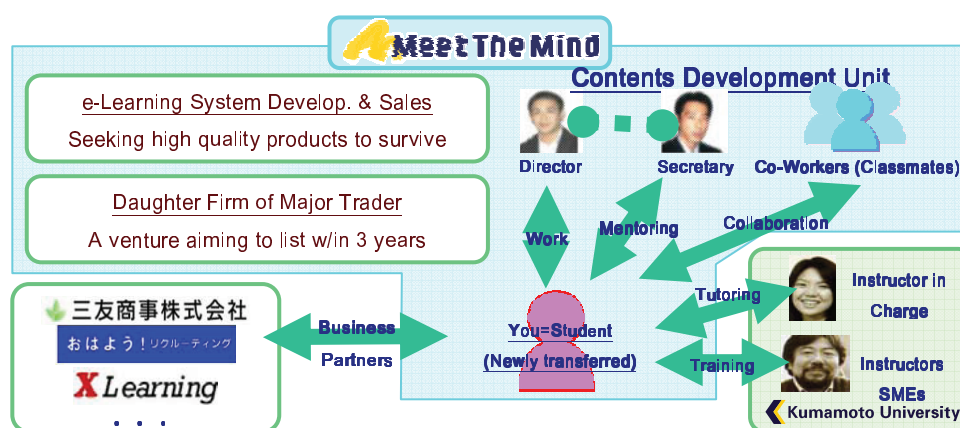

Figure 3: SCC Setting and Associate Characters

Figure 4 shows weekly learning cycle and relationship between newly developed SCC contents and the existing contents on our Learning Management System (shown as Contents on WebCT). After being familiarized with the cover story and missions at the outset of the semester, the student will receive the work order from Mr. Nakamura that describes the week's assignment (shown as 1). The next screen that the student will see is an explanation as to how to tackle this work order, by relating the work order to the course contents. Then the students are directed to a corresponding block of an existing course, to get enough information and exercises in related tasks. Finally, the student submits a work report to Mr. Nakamura by the end of the week (actually by 9 a.m. Monday of the following week). So, what we have developed is the cover to the existing contents on our LMS, by connecting them to a cohesive storyline.

SCC Skin for Existing Learning Portal Site

Since LMS manages contents course by course, it was necessary to build an original learning portal site for our program. This was the case even before the introduction of SCC. A learning portal site was thus developed before the start of the program in 2006 (Nakano, et. al, 2007), which has such functions of monitoring progress of all the courses currently taking, planning of selecting elective courses, frequently asked questions, related links to online resources and faculty/student individual Web sites, university wide registration site, among others.

When introduction of SCC was planned, a skin for the existing learning portal site was designed and developed. Having the same functions of the existing portal continuingly available, a new page was added to be the first page for the SCC students, as shown in Figure 5. It has an SCC Home tab as the default, shown as the left most

selection, whereas the other functions are still available as menu items to the right. Figure 6 describes the changes before and after SCC. The learning sequence was described as multiple courses have weekly tasks and assignment, going horizontally in the left half of Figure 6 before SCC. After SCC, learning sequence is shown vertically with only one thing for a given week to work on (right half of Figure 6). There also are links to show SCC weekly assignment, explanations, and submission in the center column, as well as direct links to the existing course contents on LMS in the right-most column.
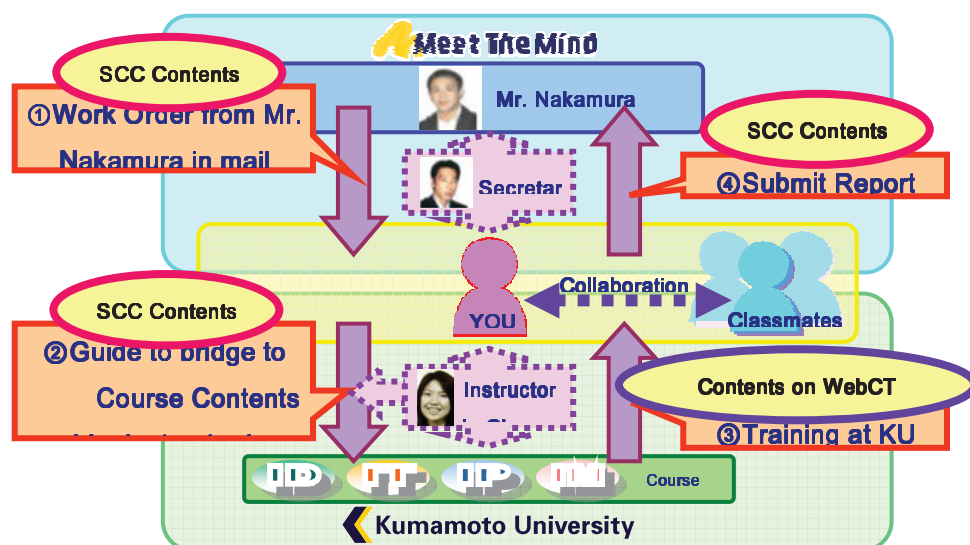

Figure 4: Weekly Learning Flow in SCC using Existing Contents
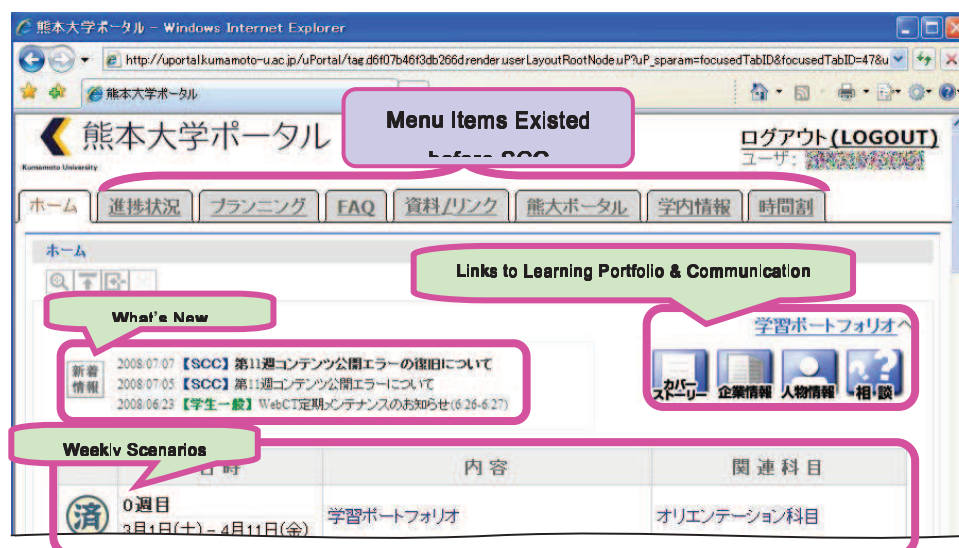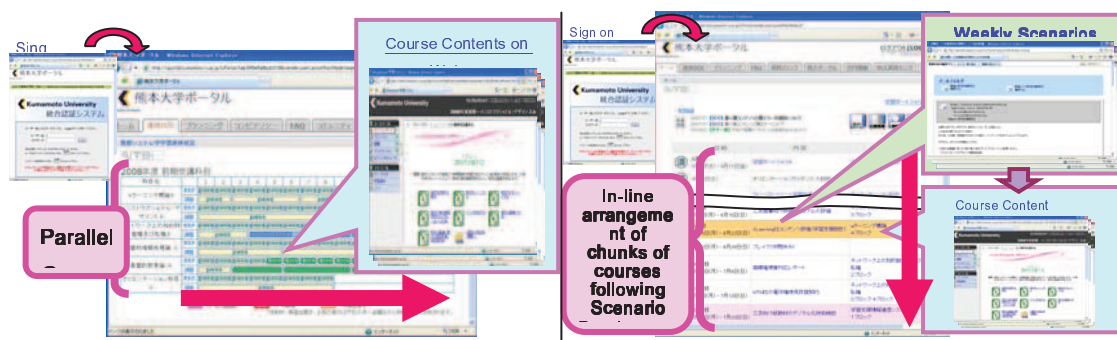

Figure 5: SCC Skin added for Existing Learning Portal Site

Figure 6: Learning Portal Flow: Before (left) and after (right) SCC

Results of the "Ultimate Questions"

The results of first trial of year 2008 with 19 students in the third cohort are being analyzed, using online questionnaires conducted twice at the ends of the first semester (August 2008) and second semester (February 2009), as well as the learning records and assignments in all the courses. Out of 19 students in the cohort, all but one (who became leave of absence due to job assignment change) completed all assignments in the first semester. Another students decided to become part time due to her health reason in the second semester, thus 17 out of 19 completed all the assignments of required courses built into SCC. The overall completion rate was 89%.

Table 2 summarizes the results of "ultimate questions" asked as a part of the questionnaire at the end of the second semester. Majority of the students who experienced our version of SCC supported our effort that brought them a satisfactory experience, positive enough to recommend to the next cohort. Many students supported SCC, not only because of the fact that the story created more realistic context, but also because weekly deadlines brought by SCC were helpful to pace themselves, as well as to create group atmosphere to complete tasks on time with other members. For those who did not wish to continue SCC for their second year, the reasons included that they felt that they became capable enough to pace their study by themselves for the second year where emphasis will shift from basic skill building to individual research, and not many required courses are there for them to take. None of them supported the idea of quitting SCC next year, suggesting ways to improve the story and coherence with the existing course assignments. One respondent wrote that since instructional design should seek the way to improve the design by trying out and formatively evaluating it, more effort should be put next year to create SCC in better quality. It was evident that as future e-Learning specialists, our students were learning by watching what we were trying to accomplish, from the perspective of the learners.

Table 2: Answers to the Ultimate Questions (End of the 2nd Semester) N=17

Question	YES	NO	Neither
Would you recommend selecting SCC, over traditional curriculum, to the students entering to our program next year?	10	2	5
Do you think it was the right choice for you one year ago that you selected SCC?	11	1	5
Do you wish SCC to continue next year in your second year?	8	5	4

Do you think our program should continue to provide SCC?	13	0	4

Conclusions: Lesson Learned and Implications

The followings are the other results from the first implementation of our SCC, which need to be supported by data in the future.

- ☐ More realistic reports for the course assignments, tied to the scenario context
- ☐ Less delays in assignments completions, due to the weekly due dates of SCC
- ☐ Buy-ins from those who experienced (3rd cohort)
- ☐ Less buy-ins from those just observed (1st and 2nd cohort who only heard about SCC)
- ☐ Benefit perceived more by those with closer/ no background experiences than by those with far/rich experiences. Some students express that they didn't need the cover story, although they think it was real enough.
- ☐ At least first case was produced by a third party in different context: we know what to fix; we showed our innovativeness!

Lesson learned and implications to those who would try similar revisions include the followings:

- ☐ SCC can be introduced as a re-designing tool to provide a cohesive theme for an online professional master program.
- ☐ SCC can be introduced easier when courses have been designed around a set of competencies through open-book analysis/design reports (pass/resubmit), rather than closed-book examinations (pass/fail).
- ☐ SCC not only provides realistic context to an existing curriculum, but also changes study/teaching routines.
- ☐ Students/faculty should be aware of changes that would be brought by SCC. An orientation needs to alert them what to expect regarding potential gains, and required changes.

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