Ingenious Attempts to Develop Self-Regulated Learning Strategies with e-Learning:
Focusing on Time-Management Skill and Learning Habit

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Abstract: The purpose of this research is to investigate effects of ingenious attempts for comprehensive supports and facilitations to promote students' self-regulated learning strategies, especially time-management skill. The attempts from the perspectives of (1) course design and development, (2) course implementation and mentoring, (3) customization of LMS, and (4) collaborations among instructors and e-learning professionals were employed for e-learning course implementation in the spring semester, 2009. The results of 814 students indicate that students might gradually gain their learning habits and felt that making a learning plan was useful for their learning. The results and attempts for the research might be beneficial for administrators, educators, and researchers who are in charge of e-learning implementation aiming to help students develop their self-regulated learning strategies.

1. Introduction

e-Learning mainly consisting of asynchronous learning activities requires learners' self-regulated strategies, especially time-managing skills. Matsuda and Yamada (2009) investigates the relationship of time-managing skills and life styles of learners for e-learning and shows that students with well-regular life styles and learning habits have better time-management skills and more successful on e-learning courses. The time-management skill is one of self-regulated learning strategies listed by Zimmerman, Bonner, and Kovach (1996). Shunk and Zimmerman (1998) summarize the cycle of self-regulated learning as forethought, performance or volitional control, and self-reflection stages (see *Figure* 1). All through the stages, time-management skill might be related to students' learning and it should be one of important and initial skills for promoting other self-regulated learning. Zimmerman, *et al.* (1996) list practicable methods to acquire time-management skills; (1) create regular learning habit, (2) set practical and feasible goals, (3) use a same place for learning, etc.

In order to assure quality of each course, the professionals need to work collaboratively in the instructional design processes. Reigeluth (1999) defines an instructional-design theory as "a theory that offers explicit guidance on how to better help people learn and develop" with characteristics of clear information, thoughtful practice, informative feedback, and strong intrinsic or extrinsic motivation.
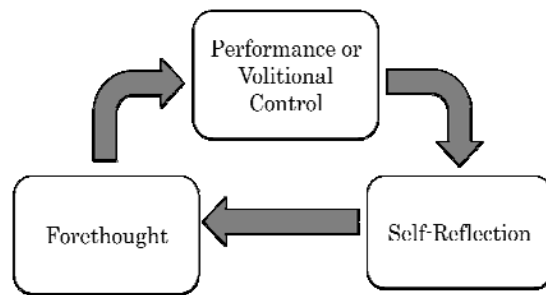

Figure 1. Academic Learning Cycle (Shunk & Zimmerman, 1998)

Tamaki, *et al.* (2006) showed that distribution of e-Learning in a sound manner needs specialists, "e-Learning professionals," who enable to maximize potentials of new technology in educational settings. One of the obstacles for healthy flourish of e-Learning in Japan and other Asian counties should be the lack of such professionals.

e-Learning professional cultivating has just started in Japan since 2006 (Tamaki & Goda, 2007). Aoyama Gakuin University, one of leading organizations of e-learning promotion at higher education started cultivating e-learning professionals; Instructional Designer, Contents Specialist, Learning System Producer, e-Instructor, and Mentor.

In this study, we focus on development of time-management skills and learning habits with e-learning as an initial and an essential skill to promote self-regulated learning. This paper introduces our ingenious attempts of comprehensive support and facilitation to help undergraduate students develop their self-regulated learning strategies for e-learning in spring semester, 2009 and examines the effects of our ingenious attempts of comprehensive supports on learners' learning habits.

2. Ingenious Attempts for Self-Regulated Learning at Otemae University

Otemae University is a small private Liberal Arts college located in Kobe, Japan. It started providing e-learning courses in April, 2008. Currently, ten self-regulated e-learning courses are offered in both or either spring and fall semesters. Total of 884 undergraduate students enrolled the courses in spring 2009. The e-learning courses are delivered with its customized learning management system (LMS) and they are two-credit elective courses. Its e-Learning center has some e-learning professionals for effective and attractive e-learning course development and delivery.

Our ingenious attempts of comprehensive supports on learners' learning habits are multidimensional. They are well-concerned and carefully implemented from the

perspectives of (1) course design and development, (2) course implementation and mentoring, (3) customization of LMS, and (4) collaborations among instructors and e-learning professionals.

(1) Course Design and Development

All courses provided at Otemae University were designed and developed under supervision of instructional designers. Working closely with course instructors, instructional designers set learning goals, evaluation methods, learning activities, and self-regulated learning materials. At the design phase of the instructional design cycle, the roles of instructors, mentors, and tutors are discussed and facilitation and support during the course implementation are also designed. Not only course goal is set, but all 15 week's learning outcomes are decided at the beginning of the course design and each week has some assignments such as quiz, discussion, and/or short report. We believe that the frequent tests or assignments would lead learning habits, which is supported by Boylan pointing out that the frequent tests was useful for developmental education at his keynote speech at the 5th Japan Association of Developmental Education Conference in 2009.

As to self-regulated materials, the instructional designers consult with contents specialists from the media selection to operational checks with LMS. Considering learner behavior with e-learning, the materials are created less than 20 minute-long. In order to keep learners' concentration and attention, the materials include a lot of interaction work and different stimuli and media types; comics, animation, short cartoon, *etc.*

(2) Course Implementation and Mentoring

A semester includes 15 week lessons in a course. In order to develop time-management skill, we set a 2-week span for each lesson as an indication for learning one lesson. After the each span, students could still learn the materials on the LMS, but if they don't complete learning materials in the span, they would be treated as tardiness of the lesson. Flexibility of time causes learners' postpones of learning and which is one of problems with self-regulated e-learning. To solve the problem, the time-span is employed. This short span may force students experience self-regulated learning cycle; plan, monitoring, self-evaluation of their learning and students have 15-time chance to practice time-management skill for self-regulated learning.

During implementation, mentors monitor students' learning progress weekdays and send messages to individuals who do not have learning progress for a few weeks via LMS and/or email besides regular mentoring activities based on the mentoring

guidelines created before the semester begins. Mentors work at Learner Support Center regularly, so when students don't solve the problems regarding to the system, they can stop by the center and ask for help to the mentors. Some students don't regularly check their email or LMS, in such a case, mentors manually create some posters with important messages and put on the bulletin boards at the school.

Another attempt for mentoring is to share course mentoring guidelines among mentors and they decide support methods beyond courses. Delivering similar messages in a short period might decrease students' motivation and to avoid such a situation, mentors share the information and activities within the assigned courses.

Prior to registering e-learning courses, we also set a trial week as same as regular face-to-face instruction courses, which decrease inevitable dropouts caused by believing that e-learning might be easy or just having curiosity on e-learning as pointed out by Horton (2001).

(3) Customization of LMS

For the time-management, the top page of the LMS was customized to show a list of registered all courses and progress indicator of each course (see *Figure* 2). All learning activities are related to the indicator. Students have to complete all activities including watch a self-regulated contents, taking a quiz, joining a discussion and so on, to get a double circle in the two-week span. Students can check their progress and attendance of 15 lessons at one view when they start their study.

(4)   Collaborations among instructors and e-learning professionals

Collaborations among e-Learning professionals are necessary for a quality e-Learning course (Tamaki, *et al.* 2006). The staff at e-Learning Center have professional skills and experiences on e-learning and collaboratively work to develop and implement the courses along the Tamaki's collaboration model (see *Figure* 3). The model was arranged to our situations and the roles of each professional are shown at Table 1.

Figure 2. Customized LMS Top Screen

Information sharing and collaborative supports to learners among professionals are keys to promote students' learning and motivate learners. To improve the courses continuously, a reflection meeting at the end of each semester, at the evaluation phase of instructional design cycle, is held and all professionals and members who are in charge of e-learning implementation at the school join and exchange information and opinions. The sustainable efforts among professionals may increase learners' motivation and retention rates.
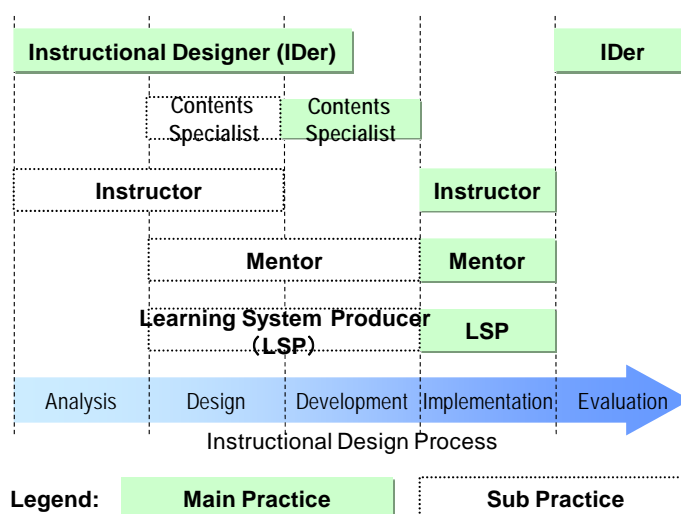

Figure 3. Collaboration Model of e-Learning Professionals (Tamaki, *et al.* 2006)

Table 1. Roles of e-Learning Professionals and University for a Course Implementation

	Analysis/ Optimization	Design	Development/Prep. For Implementation	Implementation	Evaluation
University	•Curriculum Development •Educational Goals and Direction •Course Goals				•Check Report
Instructional Designer (IDer)	•Review Course Outline •Check Syllabus Contents (Learning Outcomes, Learning Goals, Evaluation, etc.) •(Improvement Plan reflected by the last ID cycle)	•Course Design (Create Story Board, Scenario, etc.) •Lesson Plan •List content materials and copyright information	•Direction of Contents Creation •Prep.: Course Evaluation Plan •Bind all related course materials for recording purposes	•Monitor Course Implementation referring the Lesson Plan and other guidelines	•Formative and Summative Evaluation •Write Report •Improvement Ideas and Plan
Instructors	•Create Syllabus •Select Textbooks and references •Provide Information and Materials	•Check Course Design as Subject Matter Expert	•Narration and Video Recording for Contents	•Monitor Learning Progress •Reply Students' Questions on Learning Contents•Feedback and Grade on Assignments and Tests •Facilitation for Learning Activities •Grading	•Reflection for Writing Report •Check Report •Improvement Ideas and Plan
Mentor		•Provide Learners' Info.	•Prep.: Create Mentoring Guideline, Action Plan	•Mentoring along the guideline and plan •Monitor Learning Progress •Answer questions and consult students' problems	•Reflection for Writing Report •Check Report •Improvement Ideas and Plan
Contents Specialists		•Consult for media selections and Contents Materials	•Contents Development •Check Operation of Contents on LMS		•Reflection for Writing Report •Check Report •Improvement Ideas and Plan
Learning System Producer		•Advice for Learning Environment (LMS and other ICT Devices)	•Prep. : Students' Management on LMS	•LMS Management •Handle Troubles and Defects •Hear LMS improvement requests	•Summarize LMS Improvement Requests
Other School Divisions	•Post and introduce Syllabus to Students	•Academic Calendar •Unified Students' Evaluation Questionnaire •Intellectual Property Management	•Prep. : Students' Course Registration Info.		•Conduct Unified Students' Evaluation Questionnaire •input grades

3. Research Method

The subjects are total 884 students who took at least one of eight e-learning courses at Otemae University in spring semester 2009. The courses were implemented with various attempts to help students develop self-regulated learning strategies, especially time-management skill. Students' learning and planning were analyzed with their access log to LMS, dropout rate, and questionnaires.

4. Results

Results are organized by (1) Lesson Completion Rates, (2) Learning Habits, and (3) Students' Learning Plan and Actual Learning.

(1) Lesson Completion Rates

The retention rates for the 15 week lessons for eight courses are shown in Table 2. As shown in Table 2, the completion rates of the week 1 and 2 are higher than other weeks. The grand average of the completion rates for all weeks is 84.55%, which is comparatively high for self-regulated e-learning courses. Among all courses, subject H seems relatively low completion rates for lessons and this is because the course assessments require specific computer software and students might not have one on their computer at home. They might not do their assignment at home and should give up submitting the assignments.

Table 2. Retention Rates for 15 Week Lessons for Each Course

Subject	Student #	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Average
A	81	81.48%	83.95%	75.31%	83.95%	83.95%	83.95%	83.95%	82.72%	82.72%	82.72%	80.25%	80.25%	79.01%	81.48%	80.25%	81.73%
B	118	89.83%	91.53%	90.68%	87.29%	79.66%	86.44%	85.59%	88.14%	88.98%	88.98%	86.44%	84.75%	78.81%	68.64%	81.36%	85.14%
C	84	88.10%	89.29%	86.90%	86.90%	79.76%	83.33%	77.38%	78.57%	77.38%	78.57%		67.86%	75.00%	73.81%	65.48%	79.17%
D	42	97.62%	95.24%	95.24%	95.24%	90.48%											94.76%
E	339	94.99%	93.81%	92.33%	91.45%	90.86%	88.50%	87.61%	87.61%	80.24%	78.47%	82.60%	81.71%	82.01%	80.53%	78.76%	86.10%
F	78	96.15%	92.31%	92.31%	89.74%	82.05%	85.90%	85.90%	85.90%	87.18%	73.08%	82.05%	82.05%	74.36%	83.33%	78.21%	84.70%
G	94	94.68%	90.43%	90.43%	90.43%	90.43%	90.43%	89.36%	89.36%	89.36%	89.36%	90.43%	89.36%	88.30%	86.17%	86.17%	89.65%
H	48	89.58%	81.25%	77.08%	77.08%	81.25%	79.17%	77.08%	81.25%	72.92%	75.00%	68.75%	77.08%	62.50%	70.83%	56.25%	75.14%
Average		91.55%	89.72%	87.53%	87.76%	83.99%	85.39%	83.84%	84.79%	82.68%	80.88%	81.75%	80.44%	77.14%	77.83%	75.21%	84.55%

(2) Learning Habits

Students' LMS daily access from April 16 to Aug 7 was shown in Figure 4. At the beginning, students might have had some difficulties or confusions to access the LMS to learn. Gradually, they seemed to have their learning habits and the access number increased. The new lessons opened on every Thursday, and the two-week lesson span lasted till the Wednesday two weeks later. That's why students accessed most on Wednesdays to complete their learning materials in time. The two week lesson span forced students study the targeted lesson regularly.
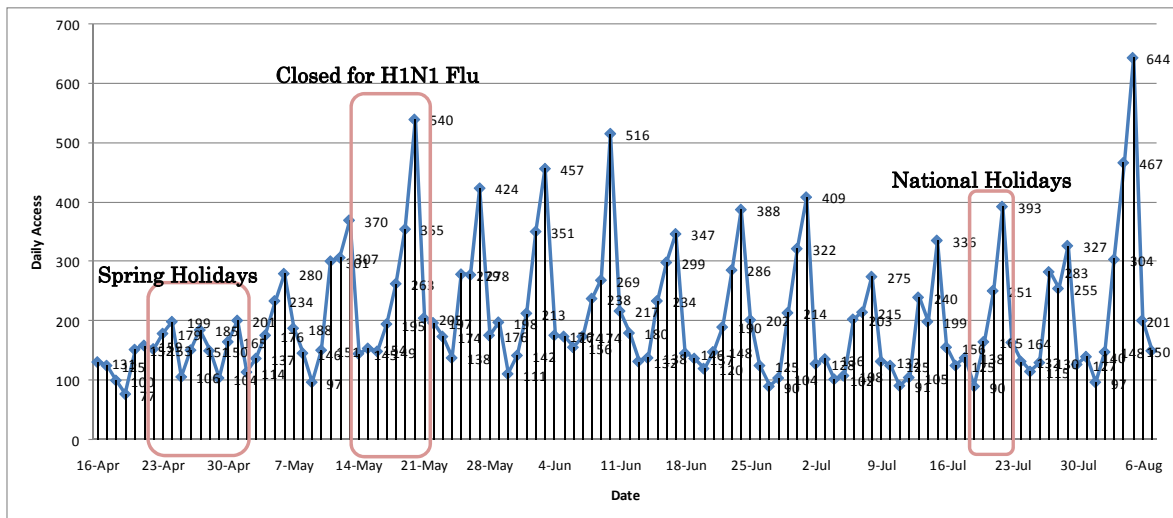
Figure 4. Daily Access of Students in Spring 2009

Once learning habits had been formed, regardless of holidays or school closure, they kept their learning habits. Although, the university was closed from May 18 to May 22 for H1N1 Flu going around. At the end of the semester, the access number decreased for a while then it went up right before the courses ended.

(3) Students' Learning Plan and Actual Learning

As to learning plan and actual learning, students' questionnaire results are summarized in Tables 3, 4, and 5. The questionnaire was conducted at the end of the semester and 714 students replied it. The correspondent rate was 87.71% over 814 students. Table 3 shows the students' response on ordinal questions related to the targeted course and learning place. About 80 % of students responded satisfied at the targeted course (Q1) and felt interested (Q2) in the course. Around 26 % of students studied at school and 69% at home (Q4).

Table 4 shows the results related to making a learning plan at the beginning of the semester. About 60 % of students made a plan roughly prior to the course, on the other hand, about 34% of students did not make a plan at all (Q7_1). Combining students' responses of "study as soon as a new lesson opens" and "Select a date of a week and regularly learn," about 34 % of students tried to learn regularly at first (Q7_2). Almost same ratio, 34%, of students responded as "Learn when they had time," which indicated not to have a regular learning habit. About 74% students felt that making a learning plan would be helpful for learning, though (Q7_3).

Table 3. Results of Questionnaire: Ordinal Questions related to the Targeted Course

No.	Questionnaire Item	Alternatives	Respondent #	%
1	Holistic satisfaction for the targeted course	Very satisfied	134	18.77%
		Satisfied	440	61.62%
		Not satisfied	94	13.17%
		Not satisfied at all	32	4.48%
2	Interest for the targeted course	Very Interesting	124	17.37%
		Ineresting	434	60.78%
		Not ineresting	108	15.13%
		Not interesting at all	28	3.92%
4	Learning place (Multiple Selection)	University	183	25.63%
		Home	495	69.33%
		Other places	14	1.96%

Note: *N* = 714.

Table 4. Results of Questionnaire: Learning Plan prior to the Course

No.	Questionnaire Item	Alternatives	Respondent #	%
7_1	Did you make a learning plan at the beginning of the semester?	I made a plan.	60	8.40%
		I made a rough plan.	371	51.96%
		I did not make a plan at all.	241	33.75%
		Other	20	2.80%
7_2	How did you want to learn the course materials?	As soon as a new lesson opens.	58	8.12%
		Select a date of a week and regularly learn	189	26.47%
		Learn not to be late.	154	21.57%
		Learn when I have time.	240	33.61%
		Depends on my mood.	51	7.14%
7_3	Do you think that you would learn effectively when you make a learning plan?	Strongly agree.	144	20.17%
		Agree somehow.	382	53.50%
		Disagree somehow.	136	19.05%
		Strongly Disagree.	30	4.20%

Note: *N* = 714.

Results on questions related to actual learning during the semester are summarized in Table 5. During the semester, about 45% of students studied almost along their plan (Q8_1). The cause of mismatch of students' actual learning and the plan (Q8_2) are mainly business (55.7%) and not interesting (12.04%). The positive learning attitudes also appear with studying ahead because of extra time (14.01%) and interesting (3.64%). About 11% responded that they studied as planned. As to revision or remake of a learning plan (Q8_3), 19% of students remade a plan, though 25% responded as "no need to change or revise." Although 19% students answered to remake a new plan during the semester, about 30% of students felt that remaking a plan might be useful

for their learning (Q8_4). About 45% of students tried to handle their delay on learning once it happened (Q8_5). However, almost same number of students answered as "learn when they had time," and not tried to handle the cases.

Related to the two-week lesson span, about 72% felt useful for making a learning plan (Q8_6) and 74% answered as it affected their learning pace (Q8_7).

5. Discussion and Future Implication

The results of daily access to LMS indicate that providing frequent tests and assignments and set due date (i.e., two-week lesson span) seem to encourage students form learning habits. Showing learners' progress at one view on the top page of LMS might also help students' time-management for their learning. It is interesting that students' learning habit seemed not to be affected by school closure or holidays.

Comprehensive support and facilitation depend on collaborations among professionals and instructors as well as the related organizations at the university. As Marshall (2007) insists, the institutional contexts might be essential for successful e-learning. Factors consisting e-learning such as technology, learners, cultures, institutional contexts, pedagogy for instructional technology *etc.* are ceaselessly changing, and we might have to learn from try and error applying the new related knowledge and research results to the practice all the time.

The recent research focuses and interests are as followed. We would combine and integrate new methods to the current e-learning implementation for development of learners' self-regulated learning strategies for their life-long learning.

- Mentoring for forethought stage of self-regulated learning cycle
- Relationship between learners characteristics and learning behavior
- Motivational factors related to self-regulated learning

Table 5. Results of Questionnaire:　Actual Learning during the Semester

No.	Questionnaire Item	Alternatives	Respondent #	%
8_1	During the semester, did you study along your learning plan?	Study along my plan.	66	9.24%
		Study almost as planned.	254	35.57%
		Did not study as planned.	196	27.45%
		Did not study as planned at all.	54	7.56%
		I did not make a plan at all.	122	17.09%
8_2	What caused mismatch of your actual learning and the plan?	Business.	398	55.74%
		Not interesting.	86	12.04%
		I studies ahead since I had some time.	100	14.01%
		I studies ahead since it was interesting.	26	3.64%
		Not mismtached of my learning and plan.	82	11.48%
8_3	Did you make a new learning plan during the semester?	No need to change or revise.	180	25.21%
		Make a new plan.	138	19.33%
		Did not make a new plan.	174	24.37%
		I have no idea since I did not make a plan at the beginning.	200	28.01%
8_4	Do you believe the revision or change of the learning plan was helpful for your learning?	Strongly Agree.	39	5.46%
		Agree somehow.	173	24.23%
		Disagree somehow.	155	21.71%
		Strongly Disagree.	42	5.88%
		No need to change or revise.	95	13.31%
		I have no idea since I did not make a plan at the beginning.	188	26.33%
8_5	How did you handle the cases that you could not learn as planned?	Try to catch up as soon as possible.	198	27.73%
		Study the lesson with the new lesson.	125	17.51%
		Learn when I have time.	286	40.06%
		Learned all as planed.	57	7.98%
		Other	26	3.64%
8_6	Was the two-week lesson span useful for making your learning plan?	Strongly agree.	176	24.65%
		Agree somehow.	337	47.20%
		Disagree somehow.	137	19.19%
		Strongly Disagree.	42	5.88%
8_7	How much did the two-week lesson span affect your learning pace?	Very much	176	24.65%
		Much	356	49.86%
		Not much	124	17.37%
		Not at all	36	5.04%

Note: *N* = 714.

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