The Effectiveness of ID Based Activities by e-learning Support Staff with a Website and a Course Material Designed by an Extended ARCS Model

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Abstract: In this paper, we present information about the effectiveness of the Instructional Design (ID) based activities aimed to assist faculty to become using e-learning materials smoothly and appropriately by the help of e-learning support staff. We proposed the ARCS+AT Model as an extension of the ARCS Model which is one of the representative ID theories by Dr. Keller. The ARCS+AT Model resulted in the ARCS+AT checklist with the aim of promoting e-learning at universities effectively and efficiently. After testing the checklist at ten universities, the first author, as an e-learning support staff at one of the Universities, created an ARCS+AT website for faculty at Osaka Gakuin University, and started distributing information about the merits, examples and procedures of using e-learning in classes to gain their attention and show them how to start, how easy and useful it is. A web-based e-learning unit for increasing "Information Literacy" is one of the contents on the website. This unit is designed to encourage learners to learn by themselves, on demand and step-by-step. At the same time, this material allows faculty to start e-learning in her/his class or seminar without any complicated preparations and it encourages them to go forward with e-learning right away. Because awareness of information literacy concepts and skills are important to many fields, and therefore, the whole or part of the material is usable and embeddable in various courses. E-learning support staff will provide a complete set of course materials with some assessments on LMS so that she/he need not perform extra work before starting. During the course, the faculty only selects items that are relevant. She/he will be able to review the progress of her/his learners at anytime online. These points are highlighted in the distributed information on the ARCS+AT website to allow faculty to gain confidence. This year, eight faculty in fifteen courses at the university responded to the call for using the course material. We report the results and feedback from the faculty to explain how it is working. Then, we will see, from a Faculty Development (FD) point of view, how they are assisted naturally to become an instructor who uses e-learning through the experience gained from these ID based activities.

Introduction

Japanese universities have started activities to develop e-learning or use ICT in education only recently. According to NIME (2009), more than 70% of universities are using ICT tools in education and more than 50% are operating an LMS (Learning Management System). However, they are having difficulties with achieving efficient and effective outcomes. For example, many universities identified issues such as, "We don't have enough human resources for operating and maintaining systems or creating educational content" or "Many faculty don't have enough skills for using ICT tools properly for their classes." Against these issues, the e-learning support staff or section in a university is expected to play one of the most important roles. E-learning support staff often need to work on the institutional level actions if they are going to solve the issues like those above. However, sometimes it is beyond their administrative authority to take such action. At "the quality assurance for education" point of view, it is

real fact that many of Japanese universities have various structural issues (Ohmori, 2008). These issues also are making it difficult for e-learning support staff to move forward.

FD and ID might be keys for e-learning support staff. Every university in Japan must implement FD by law. If staff suggest their own FD plan and if they are accepted, such plans might become institutionalized. ID theories can be effective, efficient, and motivational in various educational settings. However, FD and ID efforts are still needed since ICT oriented FD work has been practiced at only about 20% of universities (NIME, 2008). Most Japanese educators are not well aware of ID (Suzuki, 2005). In contrast, research has identified ID factors that are included in the responsibilities of FD staff (Suzuki, 2009). This suggests that ID is an important part of FD. In addition, planning and implementing e-learning will help universities clarify institutional functions or instructional issues. It is therefore necessary for university e-learning support staff to understand these factors when managing ID based activities. The ARCS+AT Model (Nakajima, 2009) is the only one based on ID theories, although there are some examples of a similar checklist such as that used at Victoria University of Wellington (2007).

In this study, we present a practice of the ARCS+AT Model at a University which was ready to take the following steps: 1) Provide e-learning support staff ID based activities, 2) Promote e-learning at the University effectively and efficiently, 3) Promote ICT oriented FD work at the same time, and 4) Promote improving the University.

The ARCS+AT Model

The ARCS+AT Model is based on the ARCS Model (Keller & Suzuki, 1985), which is one of the representative ID Theories. This model provides e-learning staff with a useful checklist for helping to motivate faculty to utilize e-learning and improve the quality of the course. In addition, this model is oriented to lead a university to successfully implement e-learning. In this model, the relationship between "e-learning Support Staff" and "Faculty Members (instructors)" at a university is equivalent to "Instructor" and "Learners" (Table.1). The ARCS Model features the factor of "Appealing the instruction" which makes learners want to learn again (or more) when they finish a course (Suzuki, 1995). The ARCS+AT Model, also, is purposed to "appeal" to the faculty to make them feel like utilizing e-learning in a class again.

Details of the ARCS+AT model are described by Nakajima, et. al. (2009). Table 1 and Figure 1 are reproduced to illustrate the ARCS+AT Model.

TABLE 1. COMPARING TWO MODELS

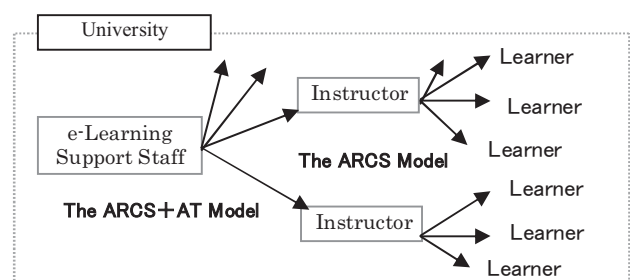|	The ARCS Model	The ARCS+AT Model
Users	Instructors will use this.	e-learning support staff will use this.
Targets	Learners will be motivated.	Instructors will be motivated.
Objective	To motivate learners to learn - To guide learners to better learning outcomes	To motivate instructors to start e-learning - To implement e-learning properly in class - To guide learners to better learning outcomes - To lead University to efficient and effective e-learning outcomes

FIGURE 1. DOUBLE STRUCTURE OF TWO MODELS

The ARCS+AT Checklist

The ARCS+AT Checklist consists of checkpoints relating to each factor of A, R, C, S and AT to clearly identify the points for improving the management of e-learning at a university. The author tested this checklist at ten universities and received feedback that this checklist worked well (Nakajima, et. al. (2009). This checklist, which e-learning support staff can use, will make the issues to be solved visible and encourage the staff to start planning or implementing for improvement. This does not mean to force them to take on more than they can by providing ideal goals that are too hard to reach. In this way, they will develop an idea of what can be done and what path to take to go forward.

As a practice for using the checklist, the author implemented it at Osaka Gakuin University and identified issues that needed to be solved. An outline of the results is shown in Table 2. It is evident that this University has a function of supporting faculty in the area of using ICT for education, but was not ready for distributing information about e-learning persuasively. As a result, e-learning was not actively carried out. In fact, the e-learning support section has only two staff and what they can do is limited. The ARCS+AT Checklist suggests that e-learning support staff could create and open the ARCS+AT Website as a solution and this has been started. This indicates that the University made a step for e-learning using the checklist.

TABLE 2. RESULTS OF CHECKING AT A UNIVERSITY (OSAKA GAKUIN UNIVERSITY)

Attention: Interesting!

A-1: Perceptual Arousal Have instructors notice that there are effective e-learning methods for courses.	ICT related portal site for faculty has been running. But it was not focused on e-learning. e-learning related paper distributions which has been provided are not well organized. Also, Mailing list must be used in better ways. We need to re-organize the environment for distributing information.
A-2: Inquiry Arousal Have instructors feel that it is useful to distribute resources of their research or teaching to their learners and to think that they would like to use e-learning	
A-3: Variability Make explanations to instructors about the effectiveness of e-learning as simple as possible.	

Relevance: I see the importance!

R-1: Familiarity Show instructors methods of e-learning that can realize their ideal courses by talking about their actual courses.	We have done almost nothing for this factor because of the environment for distributing information which we have to re-organize. We would work on this factor as we work on the re-organization above.
R-2: Goal Orientation Show instructors the importance of improvement by e-learning and have them set a goal for e-learning in their own course.	
R-3: Motive Matching Provide the information for e-learning that fits their IT literacy level. Try designing the best pace for the instructor.	

Assistance & Tools: It is reliable!

AT-1: Tool Information Give information about e-learning tools or systems that instructors can use.	We have provided the support section and show what we can clearly.
AT-2: Assistance Information Give information about staff support or assistance which instructors can get regarding using e-learning.	We have not explained or proposed about ID yet.
AT-3 ID (Instructional Design) Guidance Give information about the "know-how" of ID that makes effective e-learning become real.	

Confidence: I can do it if I try!

C-1: Instruction Requirement Share the point of completion of using e-learning concretely with the instructor.	We have done almost nothing for this factor because of the environment for distributing information which we have to re-organize. We would work on this factor as we work on the re-organization above.
C-2: Success Opportunities Prepare to compare the effectiveness with and without e-learning.	
C-3: Personal Control Give the instructor the initiative also for the things related to e-learning in his/her course.	

Satisfaction: I'm glad I did it!

S-1: Natural Consequences Prepare a check sheet to give the instructor an opportunity to see how the course was improved by e-learning.	We have done almost nothing for this factor, A working group with faculty has been managed, though. No incentives for e-learning activities. We would work on this factor as we work on the re-organization above.
S-2: Positive Consequences Let instructor realize the value or the importance of e-learning by the learner's outcomes.	
S-3: Equity Maintain a standard of evaluation for the effectiveness of e-learning. Keep the system of assistance to provide instructor support equally.	

FIGURE2. ARCS+AT WEBSITE AND THE INFORMATION PAGE FOR THE WEB COURSE MATERIAL

The ARCS+AT Website

The ARCS+AT Website is provided to the ARCS+AT Checklist users as a supplemental resource for improving e-learning environments. If the results of using the checklist show that the university needs more opportunities to distribute information about e-learning, this website would be a good solution. This website has links to information related to each factor A,R,C,S and AT. Details of the website structure are described by Nakajima, et. al. (2009). This website is constructed using simple techniques so that any e-learning support staff from any university can edit and use it.

As described above, the first author used the checklist at a university. The University initiated an ARCS+AT Website as a result to distribute the information about e-learning through the website. One of the topics is about an e-learning course material which was planned, designed and developed by the e-learning support staff themselves.

In order to gain the attention of faculty, the staff chose a theme for the course material that faculty wanted students to learn. Staff posted information related to the course material production to inform faculty of its progress. Since staff realized that when extra work is involved faculty will hesitate to get involved, they produced all of the course material, LMS settings, and learner manuals themselves. In this way, e-learning support staff has been trying to pull "Expectation and Value" for e-learning (Suzuki, 1995) from faculty.

For examples, the top page of the actual ARCS+AT Website and the information page of the actions for the course material are shown in Figure 2.

ID Based Course Material

"Information Literacy" was selected as a theme of the course material for the following reasons: 1) "Information Literacy" is one of the most important skills that all the students should acquire while they are attending a university (MEXT, 2008); and 2) It is more readily accepted by faculty as supplemental material for a class. We describe the course material (design, management and assistance) that has been implemented since April 2010.

Material Design

Upon designing the self-paced learning material, ID models or theories were referenced, such as the hint lists in the ARCS Model, 9 Events Theory or the Systematic Approach Theory (Suzuki, 2002, 2005). For example, information is included at the beginning of a chapter so that learners will realize where they are in the course and what will be presented in each chapter (Figure 3). A formative assessment was conducted for appropriate revisions made to improve the quality of the course material.

The course material consists of 15 chapters and the contents of each chapter are presented as simple html pages and a set of LMS (Figure 4). Learners will read through the text pages and then complete assignments available through the LMS settings. The outcomes of the assignments will be shared in the LMS so that all learners will be encouraged by others. The instructor is able to check easily how learners progress by reviewing the management function of the LMS. As a result, the instructor can identify learners who are not doing well and easily follow up with them, too.

The course designers developed the material by themselves so as not to expend any funds. For creating the html part, they paid attention not to use special techniques in order to allow any e-learning support staff to edit the material. Also, the LMS portion was created using only the basic functions that is available in any other LMS system so as to maintain the generality of the design settings. This may be a good example that shows how it is feasible for a small e-learning support section to develop e-learning materials. In other words, e-learning support staff from any university may easily initiate e-learning by adapting this material to their own environment.

Assistance & Tools

After preparing the products, the support staff moved to the phase of announcing to faculty. They had already started distributing related information on the ARCS+AT Website and had sent the information through a mailing list. When ready, the course material was made available and announced for use in the coming new semester. At the same time, they provided faculty with LMS settings for practicing.

Some faculty responded to the announcement. E-learning support staff interviewed the faculty to review and share their class goals, their purposes for using the material as well as their expectations. The information was documented so that it could be reviewed at anytime. For the next step, e-learning support staff set up the LMS for each class and provided a brief manual for students. They explained to faculty how to request help and what to expect from the support staff. The objective was to have faculty gain confidence in using the course material without extra work for preparation or implementation.
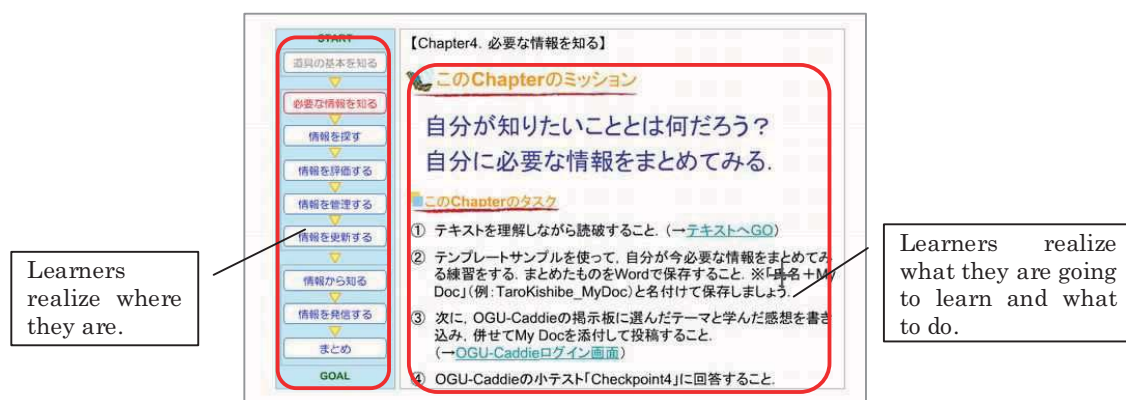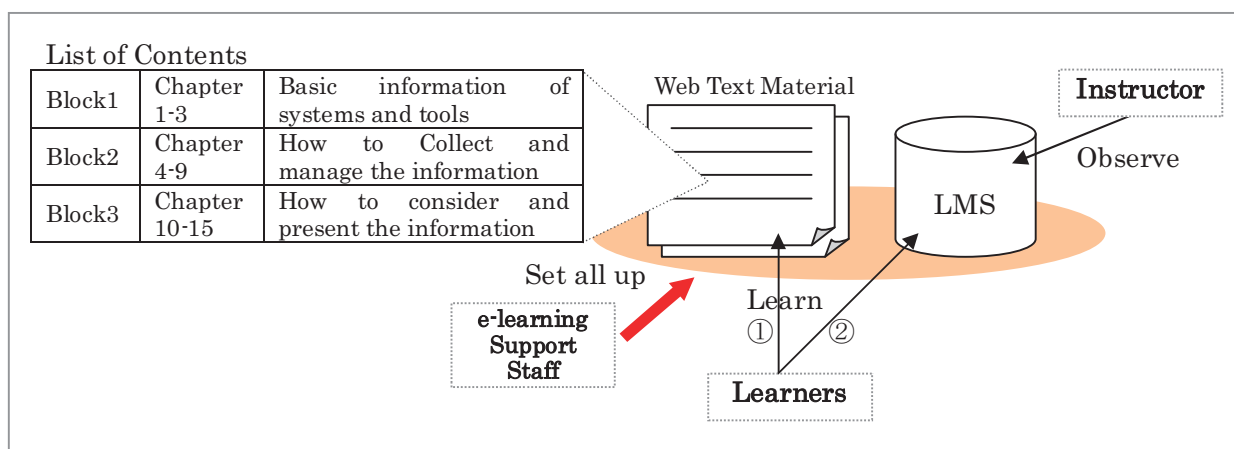

FIGURE 3. SAMPLE SCREENSHOT OF THE COURSE MATERIAL

FIGURE4. THE OUTLINE OF THE COURSE MATERIAL

TABLE3. LIST OF CLASSES USING THE MATERIAL

Class	Student Numbers	Style	Class Numbers
Seminar Class	About 10-25	Self Learning + Assisted by Faculty in between	8
		Instructed in Class	3
Regular Class	About 15-40	Self Learning + Assisted by Faculty in between	3
	About 300	Self Learning + Assisted by Faculty in between	1

Implementation

Eight faculty in 15 classes (587 students, mainly freshmen) were registered and started using the course material from April 2010. The learning methods used were: 1) Self-paced learning which was assisted by faculty online or off-line, and 2) Direct classroom instruction (Table3). "Self Learning" learners were guided to study each chapter between every class and submit questions by e-mail or face-to-face for items they could not solve. Upon finishing the course, learners completed a paper presenting what they have learned and practiced while studying the course material. In many classes, using this material served as an opportunity to practice writing reports or a thesis.

After six weeks, the author asked the faculty to complete a questionnaire. In the questionnaire, questions such as the following were asked: 1) How is the faculty managing it? 2) How are the students studying? 3) Is assistance from e-learning support staff adequate or not? 4) How is it going? Faculty answered each question by select one of five levels between "Yes" and "No".

Results and Expecting Effects

Although classes are still continuing, we attempted to determine how well the course material was working by reviewing responses to questions that were asked prior to the start of class (Questionnaire-1, Table 4) and in the middle (Questionnaire-2 Table 5). In Questionnaire-1, faculty stated that "This is worth doing." or "We will be able to work it out." This indicates that they understood and agreed with the goal and the impact of this material. We may think that we were successful in guiding faculty to initiate e-learning.

However, the results of Questionnaire-2 must be carefully analyzed. The results indicate that some faculty are having difficulty managing the course material. Some are worried about the rest of the semester, although they feel that the assistance received from e-learning support staff is adequate. This suggests that actions relating to factor C (Confidence) from the ARCS+AT Model are not enough. Conversely, we may be able to improve the situation by taking appropriate actions relating to factor C from now. We will suggest that the e-learning support staff prepare a new hint list for faculty and for students and that it should be released before this semester ends.

We want to emphasize that the eight faculty, who identified problems that need to be solved, are the pioneers of e-learning at this University. What they expressed will have the strong influence upon other faculty on campus. Therefore, e-learning support staff will incorporate the information of their assessments in the ARCS+AT Website after the implementation or evaluation of the course material. This information, including positive and negative ones, will be shared with other faculty on the website and will encourage others to start thinking about e-learning. At the same time, the eight faculty will revise their classes for the next implementation. Also, these faculty will present at conferences about what they have accomplished which will serve as meaningful information to other faculty visiting the ARCS+AT Website. Through this cycle of activities, all information accumulated will help to promote e-learning at the University (Figure 5).

TABLE4.THE RESULTS OF THE QUESTIONNAIR-1

	Yes	No	(None)
Q. Did you use LMS for your classes before?	4	4	
Q. Is it easy for you to understand how to manage the course material?	7	1	
Q. Do you think the course material can be useful to your class?	8	0	
Q. Do you think the learning outcomes can give influence to his/ her other study?	6	1	1
Q. Do you recommend others to use this material?	6	1	1

(N=8)

TABLE5.THE RESULTS OF THE QUESTIONNAIR-2

Q. Are you running the material with no trouble?	2.43
Q. Is there any problem in the contents or structure of the material?	3.29
Q. Do students realize how to learn with this?	2.29
Q. Is it going along with your plan?	2.43
Q. Do you worry about any future trouble for the rest of the semester?	2.71
Q. Assistance from support staff: Is the information enough for you?	3.29
Q. Assistance from support staff: Is the support enough for you?	4.14
Q. Tell us what you noticed.	

- I am having trouble because the speed of each student's study is getting different.
- I don't understand well enough to know my own role in the management.
- I need to arrange for integrating this material and my class.
- I am having hard times to have students work on this.
- The contents of the material will be a little difficult for my students.
- In the future, it is better to arrange for providing another version of this material which should be divided into some parts, so that it will make faculty easier to integrate with his/her class.

The numbers above are averages (maximum 5.00) for each question rated by faculty from one to five. (N=7)
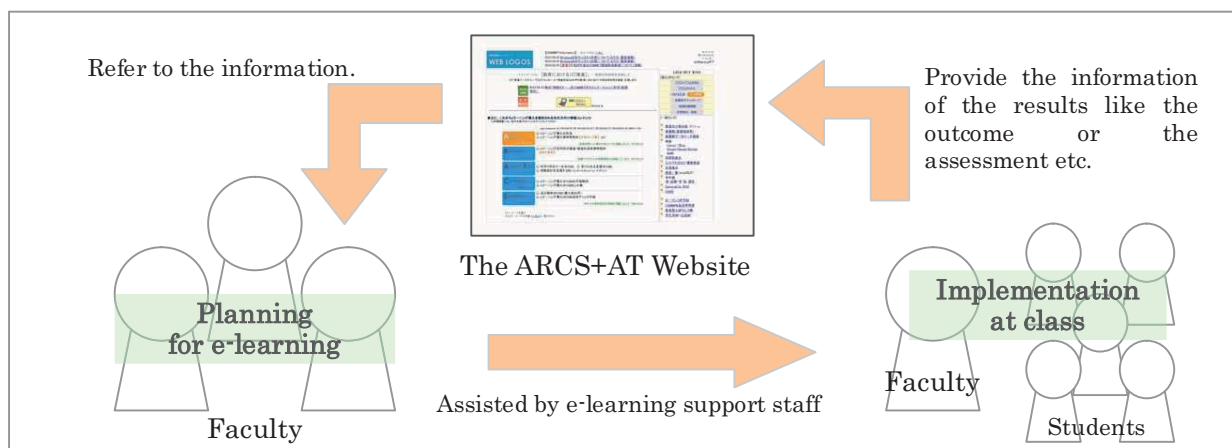

FIGURE5. THE CYCLE OF THE ACTIVITIES

Conclusion

In this study, we presented information about the effectiveness of ID based activities for e-learning by describing an implementation project at Osaka Gakuin University. E-learning staff reviewed the e-learning environment using the ARCS+AT Checklist and developed the ARCS+AT Website through implementing the ID based course material. In the future, we will continue the activities and fully evaluate their effectiveness for promoting e-learning. We plan to share the outcomes with the FD section at the University to institutionalize our effort. Additionally, we will strive to improve the quality of the ARCS+AT related activities and demonstrate its credibility as well as its general applicability in e-learning environments.

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