

A Website for e-Learning Supporters Designed by an Extended ARCS Model

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Abstract: In this study, we present a website for e-learning supporters designed by the ARCS+AT Model, which we proposed as an extension of Keller's ARCS Model. The ARCS+AT Model was originally created for the ARCS+AT checklist with the aim of promoting e-learning at universities effectively and efficiently. The website, named ARCS+AT website, is developed for helping e-learning supporters and faculty members to use the checklist. This website aims to serve as a platform where faculty and university can share the outcomes and better understanding of e-learning. First, a brief explanation of the ARCS+AT Model and the checklist will be given. Then, the results of a test use at ten universities are given, which indicated that the checklist worked well. And finally we describe the design and implementation of the ARCS+AT website.

Introduction

It is true that many Japanese universities are diligently working on activities to develop e-learning and are having difficulty in achieving efficient and effective outcomes compared to a university's own expectation (Ohmori, 2008). We found that it is better to focus on a person or a section in charge of supporting instructors and the university's e-learning development. The role of that person is important whether or not the one is a professor or staff. The one will be able to succeed when he/she has a method of checking what to do concretely and clearly to provide proper information and assistance for achieving better outcomes in e-learning. In this study, we propose a checklist for e-learning supporters based on ID (Instructional Design) theories and a website for faculty members which is aimed to be organized by e-learning supporters. We could get ten Universities' feedbacks after testing the checklist. In this paper, the word "e-learning" is used as a broader sense as equal to "ICT-enhanced learning".

As we researched, we didn't find any other study of checklists for promoting e-learning at a University which is based on ID theories, especially ARCS Model (Keller & Suzuki, 1988). We could find a ID-based checklist for faculty (Florida Gulf Coast Univ., 2009) or a checklist for an university (Victoria Univ. of Wellington, 2007), though.

The ARCS+AT Model

First, we should clearly determine what this study will target for e-learning support; who will support, who will be supported, and what the range of support is. E-learning supporters will be professors or staffs at a section which assists all the faculty at a University and they will target faculty members who are going to utilize e-learning for the courses with some or much assistance. The range of support is wide like from environmental setting to learning material design. It includes whatever needed in the courses. Nevertheless, the checklist is aimed to provide supports just within the capability the University has.

Next, we need to check the current situation surrounding faculty in Japanese higher education. Lately, all Japanese Universities including both of national ones and private ones are required to prove and improve the quality of education. Then faculty members are requested to improve in designing instruction or handling their computer literacy effectively and efficiently. But in many cases, it's overwhelming for them to do it by themselves individually in limited time and skills (National Institute of Media and Education, 2009).

In this case, a University must assist faculty members but still they must work on getting better skills for the computer literacy and for designing instruction. At this point, we can call them "Learners". Then, we came to think that it can be useful for e-learning supporters to use ID theories or ID-based checklist when working on the support. The checklist will help e-learning supporters share understandings of the merit of e-learning with the university or faculty and will allow them to keep consistent with the direction of the University's policy.

The ARCS Model, which is an instructional design model based on psychological motivation, will be the best model for this kind of situation to increased learners' motivation successfully. So we proposed the ARCS+AT Model which is based on the ARCS Model. This model is aimed to provide e-learning supporters a useful checklist for helping them motivate faculty to utilize e-learning and make the quality of their courses better and is aimed to lead the university's success in e-learning also.

In the ARCS Model, the relation between "instructor" and "learners" are spotlighted and usually it's between "a teacher" and "students" in class. But in this study, we put "e-learning supporters" and "faculty members (instructors)" at a University on it at the same time. In this way, e-learning supporters can give influence to classes and the university. But the four factors of Attention (A), Relevance (R), Confidence (C) and Satisfaction (S) in the ARCS Model will not be enough because the ARCS Model does not expressly cover the factor of assistance from the university. Therefore, we added another factor, Assistance & Tools (AT), to complete it. The "AT" features of ARCS+AT consists of three factors —tools that can be used, staff assistance that can be provided, and ID theories that can be used to improve the course. With this factor, faculty members will be motivated by understanding how much assistance they can get from the university.

Table 1 shows how the ARCS+AT Model is. We compare the two models to illustrate their differences in Table 2. You can see the double structure of the models in Figure 1.

TABLE 1. THE FACTORS OF ARCS+AT MODEL

A	Attention	A-1: Perceptual Arousal / A-2: Inquiry Arousal / A-3: Variability
R	Relevance	R-1: Familiarity / R-2: Goal Orientation / R-3: Motive Matching
AT	Assistance & Tools	AT-1: Tool Information / AT-2: Assistance Information / AT-3: ID Guidance
C	Confidence	C-1: Instruction Requirement / C-2: Success Opportunities / C-3: Personal Control
S	Satisfaction	S-1: Natural Consequences / S-2: Positive Consequences / S-3: Equity

TABLE 2. COMPARING TWO MODELS

	The ARCS Model	The ARCS+AT Model
Users	Instructors will use this.	e-learning supporters 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

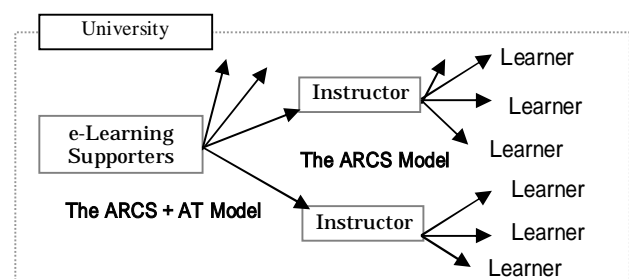


FIGURE 1. DOUBLE STRUCTURE OF TWO MODELS

The ARCS+AT Checklist

With such background, we started to analyze the ARCS Model Hints List (Suzuki, 2002) and worked on translating each factor to align it with the ARCS+AT Model. Then we added more detail for each factor to complete the checklist. The headlines of each factor in the results are shown in Table 3. You can see the full version of the checklist at Nakajima (2009).

E-learning supporters will check details with this checklist and find out what should be done for improving e-learning environment or administration effectively and efficiently. The supporters' success will lead the University to success in e-learning. In the checklist of factor A,R,AT, e-learning supporters will mainly see "how to give information to faculty members properly". In the checklist of factor C,S, they will mainly see "how to show the steps for e-learning from preparation to implementation, evaluation and improvement, and how to solve problems at each process by making clear each role or responsibility". All the steps from the factor A to S are aimed to motivate faculty members. The outcomes from the implementation can be one of the contents for the information at the factor A which will be shown to other faculty members.

The development and the effect we can expect from the use of the checklist

The development and the effect we can expect from the use of the checklist are like below.

1) E-learning supporters motivate faculty to utilize e-learning in the direction the University expect. 2) The courses by the faculty members will be instructed effectively with the ID based assistance from e-learning supporters. 3) Students in the courses will make better learning outcomes as a result. 4) All the outcomes from the courses will be shown to other teaching staffs of the faculty and the University, and it will help the university become active for e-learning. Then, 5) e-learning supporters will be able to propose proper opinions or plans to the university's e-learning strategies.

TABLE 3. THE ARCS+AT CHECKLIST (HEADLINES)

Attention: Interesting!	
A-1: Perceptual Arousal	AT-2: Assistance Information
Have instructors notice that there are effective e-learning methods for courses.	Give information about staff support or assistance which instructors can get regarding using e-learning.
A-2: Inquiry Arousal	AT-3 ID (Instructional Design) Guidance
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	Give information about the "know-how" of ID that makes effective e-learning become real.
A-3: Variability	Confidence: I can do it if I try!
Make explanations to instructors about the effectiveness of e-learning as simple as possible.	C-1: Instruction Requirement
Relevance: I see the importance!	Share the point of completion of using e-learning concretely with the instructor.
R-1: Familiarity	C-2: Success Opportunities
Show instructors methods of e-learning that can realize their ideal courses by talking about their actual courses.	Prepare to compare the effectiveness with and without e-learning.
R-2: Goal Orientation	C-3: Personal Control
Show instructors the importance of improvement by e-learning and have them set a goal for e-learning on their own course.	Give the instructor the initiative also for the things related to e-learning in his/her course.
R-3: Motive Matching	Satisfaction: I'm glad I did it!
Provide the information for e-learning that fits their IT literacy level. Try designing the best pace for the instructor.	S-1: Natural Consequences
Assistance & Tools: It is reliable!	Prepare a check sheet to give the instructor an opportunity to see how the course was improved by e-learning.
AT-1: Tool Information	S-2: Positive Consequences
Give information about e-learning tools or systems that instructors can use.	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.

Analysis of the ARCS+AT Checklist

We tested this checklist at ten Universities including public or private ones from all over Japan. We asked e-learning supporters or persons in the close position to make the following steps and then we got the feedbacks.

1) Read the guidance to realize the aim of this Model and checklist. 2) Check the support system, environment or administration of the e-learning section with the checklist. 3) Try to find out what and how they can improve within their capability. 4) Answer to the questionnaire for the test we offered after finishing the steps above.

The data we could get from this test is a) Opinions to the checklist itself. b) Opinions to the use of the checklist. c) Results of the checklist. The testers answered the data c) is useful in the questionnaire, but it is not analyzed in this paper because it shows only the check result for each university.

By analyzing the feedbacks, we realize that the checklist can be useful at university when it gets improved.

Analysis of the usage of the checklist

The results of the questionnaires say “e-learning supporters will be able to check, improve and propose opinions to the university by this checklist”, “There will be some possibilities that we can use ID theories to e-learning activities by the use of the checklist”, “e-learning supporters will be able to give opinions to e-learning strategies of the university.”, “But it is worried in collaborating with faculty members.”(See Table4).

The Result that the checklist could not make e-learning supporters feel confidence in collaborating with faculty members means that the checklist will not work well. Against this issue, it will be useful to give resources like check-sheets they can use at the actual situation or examples of e-learning they can show to faculty members. If these are given to them at the same time as the checklist, it will make them feel confidence with the checklist. On the other hand, one of the most important opinions they gave us is that it will be all up to how much e-learning supporters are familiar with ID. At this point, we would like to suggest that we must focus on the necessity of training people’s skills as IDer. It is possible to say that e-learning supporters will be able to arrange for collaborating with faculty without any problem if they are ready for ID.

Analysis of the checklist itself

We can divide all the feedbacks to the checklist itself in three groups; 1) More detail definition is needed. 2) More explanation or examples are needed. 3) Fundamental change is needed. The percentages of each division are shown in Table5. You can see that most of the feedbacks are in the area of 2). So we revised the checklist simply to get ready for the next test-use at other Universities (Nakajima, 2009).

TABLE4. THE RESULTS OF THE QUESTIONNAIRES

Did you feel that the checklist is useful for promoting e-learning?	Yes	4
	Yes, if improved	6
	No	0
Could it be an opportunity to check e-learning situations at your University to check with the checklist?	Yes	9
	No	1
	Others	0
Could it be an opportunity to improve ideas or proposals after using the checklist?	Yes	8
	No	1
	Others	1
Do you think it will promote the collaboration for e-learning with faculty members at each course?	Yes	2
	No	2
	I don't know	6
By using this checklist, do you think you can be familiar with ID and use it at actual cases?	Yes	4
	No	4
	I don't know	2
Do you think it is possible for you to propose proper plans or opinions for improving University's e-learning strategies after the activities by the checklist?	Yes	6
	No	1
	I don't know	3

TABLE5. THE FEEDBACKS TO THE CHECKLIST

	All	A	R	AT	C	S
1) More details of definition is needed	30	0	7.5	5	2.5	0
2) More explanation or examples are needed	30	7.5	15	2.5	25	12.5
3) Fundamental change is needed	0	0	0	0	2.5	0

Each point (%) = (the numbers of feedbacks to the factor / the numbers of checkpoints at the factor * the numbers of respondent) * 100

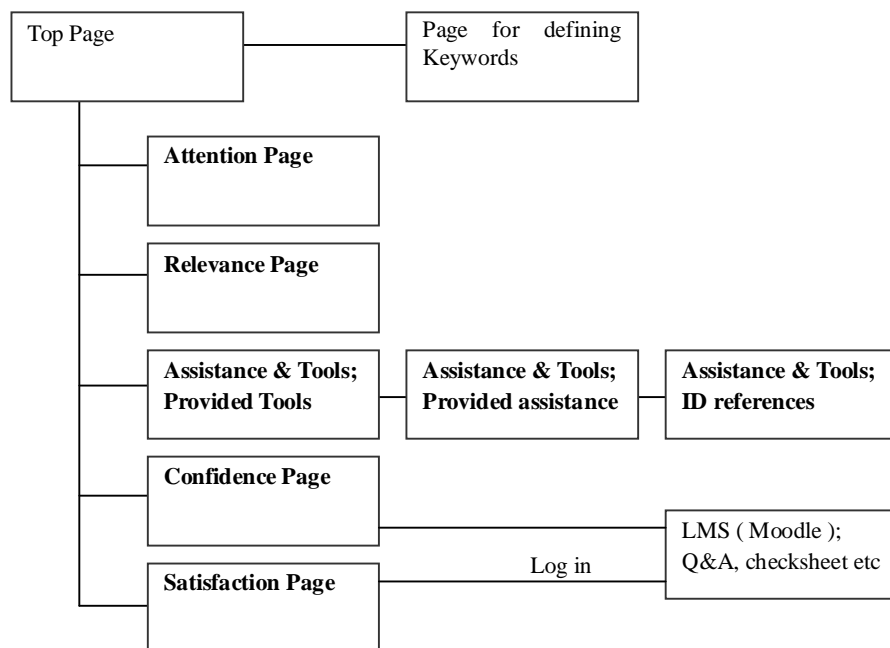


FIGURE2. ARCS+AT WEBSITE SITEMAP

The ARCS+AT Website

It is important to provide faculty members or University itself an opportunity to access anytime to the information which explains about the details or good examples of e-learning directed by the University. This point is included in the checklist. Constructing a website for faculty members which contains the information that motivates them could be the solution. This website could be also a platform as a help for e-learning supporters to work with the university about the e-learning strategies. We decided to keep each factor of ARCS+AT as each content page on this website so that the model will work well for the aim. (See Figure2)

As we described above, this website has the contents of ARCS+AT. From the top page, you can access each page directly. In each page, we expect that filing proper contents on each page means that the e-learning strategies are being improved by the ARCS+AT checklist.

In the page of factor C and S, faculty members can access to the page for the local information of utilizing e-learning which is created in the Learning Management System "Moodle" which is one of the most popular open source LMS's. Faculty members can get more information or get interaction with other members or e-learning supporters. At the same time, e-learning supporters will realize who came or when they came, what they did there by the LMS's log management function. The data will help e-learning supporters provide better assistance to faculty members. You can see the details of this website at Nakajima (2009).

Figure3 shows example screenshots from the website which is now active at a private University. It could be customized easily just by putting the header information and the side menu information which links to the University's local systems or contents. As Table6 shows, there will be the University's local information about e-learning in the page of factor AT, C and S. But we construct the other parts of the website just with the information from original public ones. On the other hand, we did not use any high technique in making html. According to these, we expect this website to encourage e-learning supporters to make their own ARCS+AT website for their Universities. They can use the whole resources of this sample website or they can use just a part or idea, as long as they realize what this website is going to mean. We would like them just to meet with better outcomes in e-learning strategies.



TABLE6. OUTLINE OF EACH FACTOR'S CONTENTS

	Contents	
A	- Merits of e-learning - Introduction of e-learning examples - What will be solved by e-learning?	Off-Campus Information mainly
R	- Academic area where e-learning works well - Good examples from each area	
AT	- Provided tools @ XX University - Provided assistance @ XX University - ID theories which will assist your designing instruction	On-Campus Information mainly
C	- Steps from preparation to implementation - Hints @XX University	
S	- Steps for evaluation @XX University - Voices(Outcomes) of e-learning experiences	

*The lines in a bold type are the information from On-Campus.

We would like to continue the study on how useful this website by evaluating and improving it steadily because it has been just three months since we opened this actual website. We also would like to present outcomes of collaboration with faculty members or of exchange with the university whenever we get enough data.

Conclusion

In this paper, we proposed the use of the ARCS+AT Model, checklist and especially the website for e-learning supporters. The checklist we have developed is intended to be applicable for achieving better outcomes in e-learning at any university. It has also the meaning of helping learners, instructors, e-learning supporters or even universities so that they can concentrate on teaching or learning by using ID theories and technologies as a tool. After the test use at ten Universities, we got positive feedbacks which are good enough for us to say that it will work fine at Universities.

We will continue our study with verifying psychological factors and improving the checklist. Also, we will plan to do testing the checklist at Universities to improve its quality. Through this activity, we would like to strengthen relationships among universities and would like to contribute to promoting Japan's e-learning strategies.

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