

# Designing E-Portfolio with ARCS Motivational Design Strategies to Enhance Self-Directed Learning

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## Abstract

This paper presents the instructional design effect on motivation towards the implementation of e-Portfolio with ARCS Motivational design strategies to enhance self-directed learning. The purpose of the study was to examine the learners' motivation level after the implementation of e-Portfolio. Initially, this paper was conducted to study a total number of twenty-four students as a small group evaluation. The survey instrument was divided into four subscales which involved (1) attention, (2) relevance, (3) confidence, and (4) satisfaction to measure the motivation subscales among learners. The findings reported that learners' motivation has a significant effect to create a desire and awareness in constructing, developing and exploring their knowledge. The e-Portfolio with ARCS motivational design strategies will enforce the learner in gaining their interest in learning. The integration of e-Portfolio and ARCS motivational design strategies will create an opportunity to enhance the transmission and instruction approach in teaching and learning for higher education environment.

**Keyword:** e-Portfolio, motivation, ARCS instruction design affect motivation, self-directed learning

## 1. Introduction

In e-learning implementation, motivation is probably the most important element. Learners should know the instructional goals of the e-learning program and the benefits obtained from the instructional procedure. Even when carrying out the program, learners should be able to evaluate their progress and achievement of instructional objectives with the aid of formative and summative tasks/assignments and informative feedback from the tutor and the other learners in order to redefine a possible erroneous approach.

Motivation is widely known as a focal point in meaningful learning (Bandura, 1993; Gagne, 1985; Keller, 1979; Biggs, 1991; Maslow, 1943; Murat, 2010) and plays an important role in teaching and learning. Thus, Deci and Vallerand (1991) addressed the needs to energize motivation consisting of relatedness, autonomy and competence which are essential to be aligned in learning practices and to perform better, while encouraging students to be driven in achieving goals. Past researchers such as Keller (1979); Keller and Suzuki (2004); Keller (1983, 1987, 2010); Oliver and Reeves (1996) have proven that students' motivation might affect learning and instructional strategies. Theoretically, enhancing the instructional design will directly have a positive effect on the learners' motivation or vice versa.

E-Portfolio is a learning support tool (Syamsul Nor Azlan, 2015b) that emphasizes learning process, experience and professional development to present the achievement (Syamsul, Amin, & Norazah, 2015). For this respective reason, motivation is needed to energize the desire to learn. Thus, while designers and facilitator may assume that extending the array of resources will enhance learning, the individual's familiarity, beliefs, motivations, and practices may influence the extent to which available resources complement or confound student-directed learning.

Jeamu, Kim and Lee (2008) found that low self-motivation and interest can be major obstacles that prevent learners from concentrating. Hence, motivation becomes an essential factor when learners use online learning environment. In this context, ARCS Motivational Design model has been selected as a problem solving approach to stimulate and sustain individuals' attention that must be obtained and maintained in a learning process (Keller, 1983). In addition, Keller defines the ARCS acronyms into four-factor theory that measures individuals' level of

motivation. In this study, the researcher aimed to examine the significant of ARCS subscales that impact the use of e-Portfolio.

Firstly, attention is about gaining and sustaining attention to the learning context (Green & Sulbaran, 2006). Mayer (2003) stated that appropriate instructional design material is able to gain learners' attention. Gagné and Driscoll (1988) listed three actions that can be used to enhance learner attention as follows; vary the appearance or sound of instructional materials; use concrete examples; and informing the novelty and incongruity.

Secondly, relevance is about relating to clear learning goals and needs. The learning content must not only be accurate but also needs to be aligned with the learning outcome. The perceptions and compatibility of content with learners' needs must enable them to always be connected (Keller & Suzuki, 2004). Gagné and Driscoll (1988) listed assuring instructional relevance as follows: 1) ensuring that content relates to the learner's past experience and knowledge; 2) explaining the present worth of the skills, knowledge, and attitudes being learned; and 3) taking steps to convince the learner of the value of what is learned for future activities that are valued. Personal needs and traits related to relevance can be enhanced by showing learners that their success is a direct consequence of their efforts. Feedback is provided to assess learners' effort and then help heighten the learner's sense of accomplishment.

Thirdly, confidence is about their expectancy of success and failure in learning (Bohlin, Milheim, & Viechnicki, 1990). Keller (2010) indicated that confidence is related to the learners' feeling of personal control and its influence on learning effort and performance. Gagné and Driscoll (1988) suggest a strategies to promote learner confidence as follows: 1) clear and precise instructional objectives; 2) sequence successive lessons and mastered; 3) increasing the learning and attainment of successful outcomes. Gagné and Medsker (1996) also suggest designing a challenging environment in which learners capable to perform their potential. However, the learning situation should begin to strengthen their confidence and gradually change the level of difficulties. The facilitator needs to establish a good rapport with the learners then increase expectancy for success. Instructional strategies expected to enhance the learners' confidence include the provision of advance organizers and clear learning objectives. In this particular, confidence can develop through feedback that highlight the relationship between learner effort and the results achieved.

Lastly, satisfaction is about accomplishments in learning. There are several factors that can influence the satisfaction such as feedback. By using a thorough feedback process provided learning iterations and experience that gives support to learner confidence; sustain the attention, and the relation of learning activities. Establish with clear learning objectives can avoid the negative impact on the learner. Therefore, providing a clear and concise instruction would gain the employment by the learners.

The assumptions that underlie Keller's systematic model are: people's motivation can be influenced by external events. Keller and Suzuki (2004) highlighted the aspect of learner volition in relation to motivation. Motivation can be categorized in two levels: The first level is an individual's needs, wishes, satisfaction, challenges or purposes together with a belief about whether it is within one's power to satisfy the desire, or accomplish the goal. The second level is the manner of using the will, or volition, which refers to a process for changing intentions into actions such recognition and compensation. The distinction is between will and action. While a learner may be captivated to engage in a learning intervention, will he or she be sufficiently motivated to turn desire into the actual act of learning, and will he or she be adequately motivated to continue in that learning intervention once demonstrating a volition to learn.

Accordingly, Gagné and Medsker (1996) suggested that it is the responsibility of the instructional designer to identify what is most likely to motivate individual learners or groups, and then design learning activities that best satisfy these motives into the instructional design. Sun, Tsai, Finger, Chen and Yeh (2008) agreed that when learners hold significantly positive between motivation and instructional methodology, it will bring good impact on their online learning satisfaction level and an indifferent perception may cause otherwise.

## 2. Methodology

This is a case study based on selected groups of participants among learners and lecturers were purposely done according to their computer skills, available time and venue for participating as well as their "willingness and ability to work with the researcher" (Alias & Hashim, 2012; Muhammad, Nurullhuda, & Sahrir, 2012). The determination of sampling size in the formative evaluation of small group and field user testing sessions was done based on (Tessmer, 1993) who has mentioned the usability of less than 20 participants in small group evaluation and between 20 and 30 participants for field test evaluation. A set of survey was conducted to examine the usability of e-Portfolio with ARCS Instruction Design Affect Motivation between small group and facilitator.

### 3. Data Analysis

This section describes the constructs of instructional design effect on motivation taken among the small group of learners. The feedback consisted four states of motivation such as attention, relevance, confidence and satisfaction during the implementation of e-Portfolio. This questionnaire contained 36 questions with 5 point Likert scale anchored in completely disagree and completely agree that demonstrated how the learners rated the potential of e-Portfolio. They confirmed that e-Portfolio had a potential to motivate them in the learning process. All of the twenty-four participants responded to the evaluation surveys. Table 1 shows the overall mean score, frequency and percentage of the instruction design affect motivation one-Portfolio according to constructs as follows.

Table 1. Overall mean score, frequency and percentage of the instruction design affect motivation on e-Portfolio according to constructs

Motivation Aspect	Frequency and Percentage				SD
	Mean Score	Mean Score	Mean Score	Mean Score	
	1.00-2.33	2.34-3.66	3.67-5.00		
	Low	Moderate	High		
Attention	0 (0%)	4 (16.7%)	20 (83.3%)	3.93	.494
Relevance	0 (0%)	6 (25%)	18 (75%)	4.01	.517
Confidence	0 (0%)	10 (41.7%)	14 (58.3%)	3.78	.336
Satisfaction	0 (0%)	7 (29.2%)	17 (70.8%)	3.93	.485

Table 1 shows the overall mean score, frequency and percentage of constructs that examine the level of motivation of e-Portfolio according to constructs. As reported, relevance has the highest mean score (M=4.01) and confidence has the lowest mean score (M=3.78). There are explanation of constructs and items as follows:

#### 3.1 Instruction Design Affect Motivation-Attention

This construct involved eight items representing the level of attention as described in Table 2. The mean score and standard deviation by items can be referred as follows.

Table 2. Mean scores and standard deviations of the attention subscale

Items	Aspects	Mean	S.D
A1.	There was something <b>interesting at the beginning</b> of each lesson that got my attention.	4.13	.612
A2.	These materials are <b>eye-catching</b> .	4.00	.659
A3.	The <b>quality of the writing</b> helped to hold my attention.	3.88	.612
A4.	The <b>E-Portfolio</b> look interesting.	4.00	.659
A5.	The way the <b>information</b> is arranged on the <b>E-Portfolio</b> helped keep my attention.	3.71	.690
A6.	This <b>E-Portfolio</b> had things that <b>stimulated my curiosity</b> .	3.96	.624
A7.	I learned some things that were <b>surprising or unexpected</b> .	4.04	.690
A8.	The <b>variety of reading passages</b> , exercises, illustrations, etc., helped keep my attention on the individual lessons.	4.00	.659
<b>Overall total of Level of Attention</b>		3.93	.494

As Table 2 shows, the researcher found that the learners got the attention when the beginning of the lesson is interesting ( $M=4.13$ ), surprising or unexpected ( $M=4.04$ ), eye-catching ( $M=4.00$ ), variety of reading passages ( $M=4.00$ ), stimulated curiosity ( $M=3.96$ ) with the quality of writing ( $M=3.88$ ) and information ( $M=3.71$ ) that hold learners attention. The degree of students' attention with e-Portfolio showed a significant values to ensure the success of learning process ( $M=3.93$ ,  $SD=.494$ ).

### 3.2 Instruction Design Affect Motivation-Relevance

This construct involved seven items representing the level of relevance described in the next tables. The mean score and standard deviation by items can be referred to Table 3.

Table 3. Mean scores and standard deviations of the relevance subscale

Items	Aspects	Mean	S.D
R1.	It is clear to me how the content of this material is <b>related</b> to things I already know.	4.00	.659
R2.	There were <b>stories, pictures, or examples</b> that showed me how this material could be important to some people.	4.17	.565
R3.	<b>Completing</b> this <i>E-Portfolio</i> successfully was important to me.	3.96	.624
R4.	The content of this material is relevant to my <b>interests</b> .	3.92	.584
R5.	There are <b>explanations or examples</b> of how people use the knowledge in this <i>E-Portfolio</i> .	4.00	.722
R6.	I could relate the content of this <i>E-Portfolio</i> to things <b>I have seen, done, or thought about in my own life</b> .	4.00	.590
R7.	The content of this <i>E-Portfolio</i> will be <b>useful</b> to me.	4.04	.624
<b>Overall total of Level of Relevance</b>		4.01	.517

Table 3 reported that e-Portfolio provides a relevance stories, pictures or examples ( $M=4.17$ ) that useful ( $M=4.04$ ), and related ( $M=4.00$ ) to them as a learners. The content designated in e-Portfolio is well-explained ( $M=4.00$ ) and real life ( $M=4.00$ ) to ensure learners complete ( $M=3.96$ ) the tasks and gain interest ( $M=3.92$ ) in learning. The degree of relevance with courses has indicated an important element in evaluating the effectiveness of the e-Portfolio ( $M=4.01$ ,  $SD=.517$ ).

### 3.3 Instruction Design Affect Motivation-Confidence

This construct involved eight items representing the level of attention as described in the Table 4. The mean score and standard deviation by items can be referred as follows.

Table 4. Mean scores and standard deviations of the confidence subscale

Items	Aspects	Mean	S.D
C1.	The content and <b>style of writing</b> in this <i>E-Portfolio</i> is worth knowing.	3.92	.584
C2.	When I first looked at this module, I had the impression that it would be <b>easy for me</b> .	3.58	.717
C3.	After reading the <b>introductory information</b> for each lesson, I felt confident that I knew what I was supposed to learn from the lesson.	4.04	.550
C4.	As I <b>worked</b> on this <i>E-Portfolio</i> , I was confident that I could learn the content.	3.88	.741
C5.	The assignment in this <i>E-Portfolio</i> was too <b>difficult</b> .	3.38	.875
C6.	After working on this <i>E-Portfolio</i> for a while, I was confident that I would be able to <b>pass the final exam</b> .	3.50	.590
C7.	The good <b>organization of the content</b> helped me be confident that I would learn this <i>E-Portfolio</i> .	3.96	.359
C8.	<b>Completing the assignment</b> for this <i>E-Portfolio</i> gave me a satisfying feeling of	4.04	.624

accomplishment.		
<b>Overall total of Level of Confidence</b>	3.78	.336

As can be seen in Table 4, the researcher found that the learners would feel confident after reading the introductory information (M=4.04) that explain the overview of the lesson. The learners expressed that it is important for them to complete the assignment (M=4.04) because of the good organization of the content (M=3.96) and writing styles (M=3.92) that convey them to work (M=3.88) easily (M=3.58) to pass in the final exam (M=3.50) while it was too difficult (M=3.38). The degree of confidence plays an important subscale in evaluating the effectiveness of e-Portfolio (M=3.78, SD=.336).

### 3.4 Instruction Design Affect Motivation-Satisfaction

This construct involved five items representing level of relevance described in the next tables. The mean score and standard deviation by items can be referred to Table 5.

Table 5. Mean scores and standard deviations of the satisfaction subscale

Items	Aspects	Mean	S.D
S1.	I <b>enjoyed</b> this <i>E-Portfolio</i> so much that I would like to <b>know more</b> about this topic.	4.00	.722
S2.	I really <b>enjoyed studying</b> this <i>E-Portfolio</i> .	3.88	.537
S3.	The <b>assistance</b> I received during this <i>E-Portfolio</i> helped me feel rewarded for my effort.	3.92	.654
S4.	It <b>felt good</b> to successfully complete <i>E-Portfolio</i> .	3.96	.464
S5.	It was a <b>pleasure</b> to work on such a well-designed <i>E-Portfolio</i> .	3.92	.504
<b>Overall total of Level of Satisfaction</b>		3.93	.485

Table 5 shows the level of satisfaction gained by the learners while using e-Portfolio as a support tool. The learners shared their enjoyment to know more about the topic (M=4.00), felt good (M=3.96) and pleasure (M=3.92) while received an assistance (M=3.92) to help learners studied better with e-Portfolio. The degree of student satisfaction with courses plays an important role in evaluating the effectiveness of e-Portfolio (M=3.93, SD=.485).

### 3.5 Correlation Scores between Instruction Design Affect Motivation-ARCS Subscales

This construct involved four subscales representing the level of motivation described in the next tables. The correlation scores between subscales can be referred to Table 6.

Table 6. Non-Parametric correlations scores between instruction design affect motivation-ARCS subscales

Scale	Attention	Relevance	Confidence	Satisfaction
Participant: n=24				
<b>Attention</b>	1	.711**	.532*	.781**
<b>Relevance</b>	.711**	1	.577**	.633**
<b>Confidence</b>	.532*	.557**	1	.529*
<b>Satisfaction</b>	.781**	.633**	.529*	1

\*\* Correlation is significant at the 0.01 level (2-tailed).

Table 6 shows instruction design affect motivation-ARCS subscales was computed to assess the relationship between attention, relevance, confidence and satisfaction. There was a positive correlation between attention and three variables: relevance (.711) and satisfaction (.781). However, confidence (.532) displays a moderate correlation between others. The average correlation scores between constructs within .529 to .781. Overall, there was a strong positive correlation between attention and three variables: relevance, confidence and satisfaction.

Increase the attention subscale were correlated with increase relevance and satisfaction. However, confidence subscale need to be highlighted due to the lowest correlated for three subscales as display in the Table 6.

#### 4. Findings and Discussion

The researcher examined the instructional design that affects motivation in the e-Portfolio. All twenty-four of the participants confirmed that e-Portfolio has a potential to motivate them to become self-directed in learning. The ARCS Instruction Design Affect Motivation by Keller (1987, 2010) was adapted to make sure that the learners can sustain and prolong the learning process.

Attention subscales is the first element of ARCS model that sets the motivational tone for the remainder of the instruction. Creating for and holding learners' attention should begin with something interesting, surprising, and appealing at the beginning of the lesson. The researcher found the learners feel that e-Portfolio had the capacity to stimulate curiosity and attention in the way an information is being delivered. Accommodating the learners with a variety of resources such as passages, exercises, illustrations among many others, help them to dedicate their attention and engage with the learning.

Relevance subscales is one of the important factors which affects learners' motivation to use technology for learning. Relevance refers to people's feelings or perceptions of attraction toward desired outcomes, ideas, or other people based upon their goals, motives and values (Keller, 2010). At this juncture, the learners have a desired to use e-Portfolio to learn the new knowledge which can help them achieve a learning goals. It is very important for the learners to utilize the materials or resources which are related to them and ensure that e-Portfolio can be completed according to the aims and goals.

Every single resources in e-Portfolio were determined by their usefulness and relatedness to the learners. The researcher found that the learners appreciated having a learning material such stories, pictures or examples which provided them with options in addition to reading and discussing materials. The learning materials help learners in learning content and retention, made difficult concepts easier to understand, added clarity, and addressed different learning styles. It is very important for the learners to utilize the materials or resources which are related to them and ensure that e-Portfolio can be completed according to the aims and goals.

Learners are also able to use e-Portfolio as a platform to focus with lectures, discussion, or reflection that relevance for them in completing the task. Learners need to feel sense of affiliation with the learning materials and other peers in the course. Affiliation can be achieved by introducing non-competitive activities that help learners to establish a good rapport and relationships among peers and the instructor.

Confidence subscales is defined by Keller and Suzuki (2004). Keller (1987) is a sense of control over the learning activities enhances and builds learner confidence. The researcher found the learners stated that they were confident to work with e-Portfolio after reading the introductory information which provide clear and precise explanation of the outcomes and expectations. The content and style of writing in e-Portfolio convey a message and give the impression that the content is helpful and worth knowing. Subsequently, it transpires the learners' confidence to learn using the tool. However, as can be seen, there are three items that showed a moderate result that need to be highlighted (C2, C5 and C6). Thus, the researcher suggested to use feedback as a mechanism to build a confidence level. Particularly, the feedback must provide a constructive comment and highlights strength and weakness to improve learner performance time to time.

Satisfaction subscales is defined by Gagne (1985) and Keller (1983)) as the easiest element of the ARCS model to satisfy and is most often accomplished by providing timely and constructive feedback. Constructive feedback is not only instructs on how to improve performance on future tasks or assignments, but also encourages the learner to continue focus and highlights achievements that have been made.

However, the mean score on this subscale causes concern as learners' satisfaction can also impact their level of motivation. Satisfaction may be influenced by how e-Portfolio are developed and implemented to facilitate learning. The researcher also found that some learners felt that the projects, tasks or assignments are slightly difficult for their level. Regardless of the difficulties that some learners experienced, the findings have proven a positive result that learners are able to complete the projects, tasks or assignments. It is gratifying to report that when the learners are able to complete the activities provided, it developed the feeling of accomplishment among the learners.

In motivational strategies, learners' satisfaction is essential to take cautions for any fallible elements in e-Portfolio. It is important to see learners revered working with e-Portfolio in their study for its well-designed elements as learning support. The learners also felt that the social learning environment gives them space to trust each other and provides opportunities to improve their learning.

In this study, the researcher sought evidence to examine the relationship between motivation subscales in aspect of instructional events. As mentioned before, confidence relates to self-concept that influence the learning orientation. In such a way confidence is about abilities, attitudes and values of the learners. Bohlin (1990) and Keller (2010) point out confidence refers to the learners' attitude towards success or failure. Therefore, strengthening the self-concept is important to increase their attainment in learning. Adeyemi (2014) and Syamsul (2015a) proved that self-directed concept and motivation have a strong effect to increase confidence in doing things. In addition, providing enough support from peers and facilitator is another way to ensure that learners actively engaged with the learning process.

### 5. Limitations

The limitation of this study is refer to the number of sample. This is a case study to examine the significant of each subscales that contribute to the use of e-Portfolio on that particular sample. This study can extend to the inferential statistical with a proper sampling technique and size.

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