



# MANAGING DRILL AND PRACTICE PROGRAMS WITH A MOTIVATIONAL DESIGN AND THEIR EFFECTS ON IMPROVING STUDENTS' ATTITUDES TOWARD INFORMATION AND COMMUNICATION TECHNOLOGY COURSES

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## ABSTRACT

*In order to improve students' attitudes toward information and communication technology courses, this research aims to examine the impact of managing drill and practice programs with a motivational design. A gauge of students' attitudes toward the course was developed in order to accomplish the goal of the current study. In order to provide the students practice for the course, the researchers also employed the Blackboard learning and content management system. The semi-experimental approach was used in the current study's application to (60) first-level students enrolled in the Optimal Investment Diploma to identify the relationship between the independent variable and the dependent variable. The information and communication technologies course have students enrolled. They were split into two groups (the experimental group and the control group), each with thirty students. According to the findings, there was a statistically significant difference between the two research groups in favor of the experimental group.*

*Keywords: drill and practice programs; attitude; motivationally design; optimal investment; information and communication technology*

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## INTRODUCTION

The transition from traditional educational settings to electronic learning environments goes beyond simply converting content into an electronic form (CD, webpage), instead transforming it into interactive electronic activities that depend on the learner and that the teacher can control using contemporary technologies [1, 2]. The learner's positive participation in the e-learning environment determines how positively he feels about the content that is being offered [3, 4]. This enables him to edit, revise, and comment on the information, as well as participate in collaborative editing, addition, and improvement projects with other learners [5-7]. This facilitates the development of social networks that encourage the formation of groups with shared interests [8, 9], which the researcher thinks is creating abilities in observation, deduction, and analysis. Communication and sharing with others are other ways that learning occurs. Perhaps this is implied by Vygotsky's social learning theory, which holds that interactions with people who are smarter or more capable have an impact on a learner's attitude, style of thinking, and perception of various educational settings [10-13].

There are several motivational design models available, but the ARCS motivational design model is the most adaptable because it has been used in both traditional and electronic learning environments [14, 15]. Because it contains processes that include assessing needs in order to examine weaknesses and motivational strengths in the target sample, to facilitate planning and design of the educational environment, it has been the subject of a lot of literature and studies [16, 17]. In order to help learners' orientation in various educational contexts, this model offers a number of alternatives. John Keller created this model in 1978.

The paradigm consists of four parts; the first step, Attention, is in charge of getting things ready for learning [18, 19]. By presenting a variety of stimuli in the drill and practice through LCMS learning and content management systems, such as graphics, animated films, and posing questions and unresolved issues related to the course, the researchers believe that this step will help support the trend towards the course. Relevant illustrates the second phase. It is thought to be in charge of planning the favorable or unfavorable reaction to the things in the environment that cause this reaction [20-22]. The learner's tendencies and requirements must be related to the material covered in the drill and practice in order to establish the link. By focusing on the educational objectives and what they accomplish in terms of educational content that is given clearly and connected to the participants' prior experiences and areas of expertise, this stage can help the current research's objectives be met. Having confidence is the third

step. It is in charge of redirecting accomplishments back to the student's own skills and efforts, away from simple or extremely challenging tasks [23, 24]. The participants' self-confidence in the prospect of excellence will be increased, according to the researchers, by giving them possibilities for self-expression through the numerous engaging activities offered in drill and practice. By setting up specific objectives and offering instances of respectable achievement, this is intended to aid him in achieving academic success. The satisfied state is the fourth phase. It is believed to be in charge of fostering the development of psychologically sound attitudes in kids by encouraging their sentiments of pride in their accomplishments and unique experiences [25, 26]. It can be accomplished by immediately stimulating the appropriate answers and replies, and by delivering feedback through drill and practice.

According to the researchers, the lack of educational attitudes for dialogue and discussion between the student and the teacher on the one hand and between him and his peers on the other is one of the most significant factors contributing to the decline in students' attitudes toward the ICT course. This is in addition to the course's extremely dense content, the lack of enough discussion and sharing time, and the dearth of educational activities that aid in the completion of student learning [27-29]. Which made it easier for the pupils who were struggling with the subject. The researchers were compelled by this to investigate the causes of the tendency toward the aforementioned decision's decline. This is done by managing drill and practice programs with a motivating design through one of the learning and content management systems, or LCMS, because of its capacity to encourage a positive attitude toward the subject matter.

Researchers at Najran University noticed a decline in students' perseverance in finishing lectures, as well as a sense of boredom and a lack of commitment to attendance, while teaching the first level of information and communication technology to students pursuing the optimal investment diploma. As a natural consequence of prior activities, this caused a decline in their capacity to complete the course's goals. This led the researchers to attempt to relate the direction of the course to the low rate of course target achievement. It was proven that there had been a decline in attitude toward the course by using a measure of attitude toward the course on a sample of students. The researchers used one of the LCMS learning and content management systems to try to present the course as a collection of motivating designed drill and practice programs and manage them as a practical response to this issue.

By evaluating earlier research, such as the study of [30-38]. In addition to following the advice of their peers, instructors must use technology advancements to help students overcome challenges. Even though attitudes regarding the information and communication technology course had significantly deteriorated, the researchers were nevertheless able to design their research question. This led the researchers to discuss how drill and practice programs with a motivational design can influence how students feel about the course.

## **METHODOLOGY**

### **1. Design of Instruction for Experimental Therapy**

The use of teaching and learning theories in the educational setting is the responsibility of instructional design. Line drawings and other visual representations, referred to as instructional design models are used in instructional design. The primary application of technology in education is instructional design. Indeed, the history and advancement of contemporary educational technologies are intertwined with those of educational design. The advancement of educational design served as a major foundation for the development of educational technology [39]. The experimental treatment is created using the 10-implementation steps of the ARCS motivational design paradigm, which were previously discussed. These processes can be summed up as follows:

#### **1.1 Getting Information on Attitude and Preparedness for Content**

The new study calls for educating students on the fundamentals of utilizing the Internet. The researchers saw to ensure that the students had access to it. Additionally, the traits of their area of expertise enable interaction with computers and the Internet. In addition to their interactions with the researcher via social networks, they also took part in a variety of activities that mostly involved sharing videos, photos, news, and text comments.

#### **1.2 Analyses of the Target Group's Features**

The target audience consists of a sample of first-level students who have earned the Optimum Investment Diploma from the College of Education at Najran University's Department of Curricula and Teaching Methods. The person's ability to engage in physical activity, visual and auditory acuity, intelligence, independence, and self-affirmation strengthen at this period, and interest in speech and discussion rises. With peers and adults, he can build his social standing and confidence while developing his reading proclivity, emotional maturity, flexibility, self-control, and impulse control, as well as his ability to strike a balance between academic, social, and physical activity.

#### **1.3 A Review of the Available Information**

This is done by using a measure of the attitude toward the ICT course, noting the reduction in the trend through assessing the data, and estimating needs to identify good aspects and weaknesses.

#### **1.4 Analyzing the Goals of the Content**

The department of curricula and teaching methods at the College of Education at Najran University used the objectives of the information and communication technology course to describe the other courses in the Optimum Investment Diploma Program. The educational goals were developed in the form of behavioral statements that precisely identify the desired change in the study participants' behavior so that it is observable and measurable. This was done in light of the analysis of the content goals. It serves as a guide for modifying the learner's assistance program and creating the proper evaluation tool.

### **1.5 Selecting and Creating Relevant Techniques**

By the researchers creating the instructional materials needed to complete the information and communication technology course's goals. The content is broken up into six chapters, each of which has a collection of lessons and educational exercises that participants must complete on their own. By creating a collection of web pages for each of these chapters that include text, still and animated photos, still and animated graphics, and sound to match the topic. A page that advances the unit's goals should be placed at the start of the unit, and links shouldn't be created between those pages; links can then be created according to the SCORM standard using the Reload Editor tool.

### **1.6 Including These Techniques in the Educational Environment**

Putting together those educational units from the information and communication technology course using the blackboard system, one of the learning content management systems, after turning them into ZIP Packages compliant with the SCORM standard in the previous phase.

### **1.7 Selection and Creation of Materials Using These Techniques**

This is accomplished by using the blackboard to add activities to the educational website. Based on a question bank that is created in the blackboard, an activity is added after each chapter that is implemented individually, and an interstitial calendar is added after each activity that follows each chapter of the course. Additionally, a chat room for simultaneous conversation, a discussion board for asynchronous opinion sharing, and a site diary to correlate the many events that take place on the website with the dates on which they occur were all added.

### **1.8 Revision and Assessment**

Drill and practice programs that are motivationally created are evaluated by asking participants for their input to gauge their degree of satisfaction, and then the programs are revised as needed.

## **2. Research Tool: Attitude Scale**

With electronic learning circumstances based on the motivational design paradigm made available through the learning and content management system, the scale attempts to assess students' views toward the course before and after studying it. The scale was developed using a variety of studies and written works that generally addressed the construction and design of attitude scales. It was concerned with developing measurements of attitudes regarding technological advancements and, specifically, their usage in education Kemp, Palmer [40]; Staddon [41]; Elbyaly and El-Fawakhry [42]; Papadakis, Zaranis [43]; and Elbyaly [44].

After determining the preceding sources, the researcher created the scale phrases, which included 30 phrases, of which half are positive and the other half are expressly or implicitly negative. The researcher chose to use the Likert type method for the cumulative estimations after reviewing the literature on methodologies and techniques for creating scales. This is because of the scale's many benefits, including its capacity to discern between different things, how simple it is to use, how simple it is to fix the scale, and how simple it is to interpret the findings. Additionally, each statement's response can get any level of support or opposition [45]. With the Likert technique, statements are presented to the person, and there are five possible responses (strongly agree, agree, neutral, disagree, strongly disagree) in front of each item.

They began by applying the scale to a set of students enrolled in the Department of Curricula and Teaching Methods at the College of Education - Najran University who were pursuing the optimal investment diploma, and they identified (12) students. It was discovered that applying the scale takes about 23 minutes, based on the researchers' analysis of how long it took each student to complete all of the vocabulary questions and their calculation of the average time needed to complete the scale.

The results acquired while applying the scale to the research sample can be believed because they were produced by the Cronbach alpha equation, where the scale stability coefficient (0.91) was met. A group of arbitrators with expertise in curriculum and educational methods who were shown the scale in its first version validated the validity of the scale for application. The arbitrators' remarks were taken into consideration when the scale was finally prepared.

## **3. Experimental Design and Research Sample**

The research sample for the study's conclusion was composed of participants from the first-level class of the optimal investment certificate at the Department of Curricula and Teaching Methods of the College of Education at Najran University (60). They were also randomly divided into two groups (the experimental group and the control group), each of which had 30 people, in accordance with the experimental design of the study. Additionally, the researcher

used a semi-experimental approach that required the use of a pre-post experimental design. Utilizing a test group design with two similar groups (control and experimental).

**Table (1):** The quasi-experimental design of the study

	Pre-test	Treatment	Post-test
Control Group	Attitude scale	A	Attitude scale
Experimental Group		B	

While treatment (A) symbolizes learning the material in a regular classroom setting, treatment (B) refers to learning the material through drill and practice using the motivational design model made available by the learning and content management system.

### METHODOLOGICAL STEPS FOR RESEARCH

The description of the course "Information and Communication Technology" in the Optimum Investment Diploma Program at the College of Education - Najran University has been taken into consideration when choosing the content that will be presented in drill and practice programs with a motivational design through the learning and content management system. The amount of learning time required has also been determined using the time given in the matrix of information and skills targeted in the course, which is for a period of (10) weeks during the first semester of the academic year 2022. Participants were selected at random from first-level students in the Department of Curriculum and Teaching Methods who had the best investment diploma in line with the experimental design of the study. In the main research trial, there were 30 students in each group. The researchers used the research tool (attitude scale) on both groups before the students in the experimental group read the drill and practice materials based on the motivational design paradigm made available by the learning and content management system Blackboard. Where the course topics were added after being converted into ZIP Packages that complied with SCORM. Include extra activities, a forum for discussion, formative tests, a section for site management, a journal, a section for forum searches, a section for activities, a section for course summaries, and a section for test results. Taking into account both the setups for learner motivation and the numerous components of the ARCS model. Students in the control group receive regular classroom education, but they also receive follow-up, ample time for in-person interaction, guided and directed support and direction through direct contact, and an understanding of any obstacles to their learning. Furthermore, assign homework at the end of each class for students to turn in in person. Apply the research tool (the trend scale) to both groups, make any necessary corrections to the trend scale, and then collect all the data for analysis in order to address the research question, test the hypothesis, and produce the findings and recommendations.

### RESULTS

After the data from the attitude scale had been tracked in the pre- and post-applications, they were examined using the statistical software package SPSS V.14.

#### Make Sure the Attitudes of the Two Study Groups are Consistent before the Experiment:

**Table (2):** Relevance of pre-measurement differences in relation to the attitude scale between the control and experimental groups

	Sum of Squares	DF	Mean of Square	F. ratio	Sig.
Between Groups	9.2	1	9.2	2.1	0.38
Within Groups	298.6	58	8.22		
<b>Total</b>	<b>307.8</b>	<b>59</b>			

The value of "F" was (2.1), which, in accordance with the results of the statistical analysis and are shown in the preceding table, is not statistically significant at the level of (0.05). This shows that, at the level of (0.05), there is no statistically significant difference between the experimental and control groups before application. In the direction of the information and communication technology course.

#### The Findings of Pertinent to the Solution of the Study Question

After outlining the study's methodology, carrying out the primary experiment, and recording the results of the two student groups (the experimental group and the control group) on the trend scale (pre-post), the study is complete. The parts that follow go on the researchers' statistical methods. To confirm the validity of the claim: The adjusted earning percentage for the scores of the students in the control group and the experimental group differ statistically significantly at the level (0.05) in favor of the experimental group with respect to the direction of the course. The researchers used the Independent-Samples T-test to test this hypothesis and determined the significance of the variations between the adjusted earning percentages for the scores of the students in the two experimental control groups in the direction of the course. The following results came about:

**Table (3):** significance of "T" for the variance in the adjusted earning percentage for the students' attitude scale

scores from the control and experimental groups

Group	M	SD	M-Difference	T. Ratio	Sig.
Control Group	81.1	5.71	14.2	2.92	.027
Experimental Group	95.3	4.24			

The value of "T" for the difference between the adjusted earning percent for the students' scores in the two groups (the control and the experimental) on the attitude scale was (2.92), as can be seen from the previous table. The control group's students scored on average at 81.1. While the experimental group's students had an average score of 95.3. The value of "t" is thus determined to be statistically significant. Since the experimental group's arithmetic mean was (95.63) and increased by (14.2) over the control group, the statistical significance in these situations is biased in favor of the group with the highest average, which is the experimental group.

The experimental group, which is taught via drill and practice programs based on the motivational design model made available through the learning and content management system, is therefore statistically significant in favor of being the higher group on average. Therefore, the research premise is accepted. The modified gain ratio for the grades of the experimental group's students (taught in electronic educational settings based on the motivational design model made available through the learning and content management system) shows a statistically significant difference at the level (0.05), according to the study. Furthermore, the experimental group is being taught in favor of the control group through the standard classroom teaching method.

## DISCUSSION

The results shown in Table 3 show that the modified earning percentage for the scores of the experimental group's students who received drill and practice instruction with a motivational design showed a statistically significant difference at the level of (0.05). In addition, the control group follows the same path as the experimental group while using standard classroom study techniques. This corroborates the established scientific hypothesis. This good signal emphasizes the drill and practice on developing students' attitudes, according to the motivational design model made available, by the learning and content management system. This would lead to a trend toward the information and communication technology course among the students pursuing the Optimal Investment Diploma in the Department of Curricula and Teaching Methods at the College of Education at Najran University.

According to the researchers, the following information can explain this result:

- The learner was able to obtain material simply and fast since they had the freedom to view the content offered through the learning and content management system without being constrained by time or location restrictions.
- Drill and practice programs established with a motivational design model that met the needs of students and took into consideration their individual qualities helped students develop a positive attitude.
- The learning and content management system gives feedback to students as questions are promptly addressed, which results in a psychological sense of comfort for students because of the prompt resolution of their questions.
- The learning and content management system enables many forms of debate and discussion among students without the need for direct confrontation. This eliminates the element of fear and dread that certain students may have, resulting in the development of good attitudes and success.

## RECOMMENDATIONS

To benefit from the research's conclusions, the researchers provide the following advice:

- Advocating the use of motivational design in order to support the direction of academic courses.
- Utilize content management and other courses' drill and practice.
- To fully utilize the benefits of online courses, a comprehensive framework is needed given cooperative learning methodologies.
- Establishing training programs to assist educators and learners in using learning and content management systems.

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