Research Article

The Effect of Planning Pattern of Analysis, Design, Production, Implementation and Evaluation with the E-Learning Approach on Achievement Motivation of Progress in Third Grade Students of Secondary School in English Courses

Mojtaba Rezaei-Rad,[1,*] and Kolsoom Akbari[2]

[1]Young Researchers and Elite Club, Sari Branch, Islamic Azad University, Sari, Iran
[2]Department of Educational Sciences, Sari Branch, Islamic Azad University, Sari, Iran

[*]*Corresponding author*: Mojtaba Rezaei-Rad, Young Researchers and Elite Club, Sari Branch, Islamic Azad University, Sari, Iran, E-mail: mojtanarezaeirad@yahoo.com

Abstract

Background: An appropriate teaching method is the most important bases of quality. Several psychologists believe that learning opportunities should be organized so that each student can engage in activities based on their ability. Establishing an e-learning environment (Analysis) (ADDIE) is a proof of this claim. This study is aimed at investigating the effect of educational design model on evaluation, implementation, development, and design with the focus of e-Learning on the achievement motivation of students at the third grade of high school.

Methods: This study employed quasi-experimental methods. 2477 students from third grade in high school of education office in Sari, region 1 in the 2012 - 2013 academic year. Using multi stage cluster sampling method, two classes with sample size of 49 students were selected and were randomly divided into experimental group (26 persons) and control group (23 persons). For data collection, Hermans achievement motivation test (1970) and researcher made questionnaire in English course were utilized. Data analysis was carried out by descriptive and Analysis of covariance statistics (ANCOVA).

Results: Results showed that the use of educational design model ($P < \alpha = 0.01$), with the focus of e-Learning enhances the achievement motivation of students at the third grade of high school in English course.

Conclusions: Because of the influence of educational design model to increase student motivation, it seems that using this teaching method is useful in education.

Keywords: Educational Design, ADDIE Model, E-learning, Achievement Motivation, English, Student

1. Background

A new era well known as the intelligence community in social life has been initiated which affects the human life, its relations, education and its vocation. Technological advances have led to changes in the required qualifications and competencies and student are also following the trend of the current changing world. In recent times, relevant qualifications include critical thinking, public authority, problem-solving and decision-making (1). Application of information technology and communications is rapidly expanding and has changed all aspects of life including education in its different forms. Various countries have invested in the field of information technology and communications in order to achieve the desired education as well as achieving the best and latest methods for educational benefits by applying technology (2). Among these areas, there is education and learning (3). By statistical analysis and investigating the information about the spread of information technology in the education systems of the

world, we discovered that in various countries, including both developed and developing, comprehensive plan has been written to equip schools with various facilities such as computers and the Internet. The introduction of new educational methods, utilizing computers in classes, taking advantage of educational software and multimedia, taking advantage of the Internet and e-mail, expanding educational networks, the emergence of electronic education (e-learning) and other issues have been the new implications of applying information and communication technologies in education (4).

Education is any pre-planned strategy or activity aimed at creating inclusive learning while, learning is to create relatively permanent changes in potential behavior of the learner, provided that such changes occur as a result of experience (5). The purpose of learning and education is one of the means or methods of achieving this goal (6). Information and communication technologies play a significant impact on learning which comprises the chang-

ing role of learners and teachers, participation of students with peers, increased utilization of external sources and growth and improving plan skills and presentation (7). Generally, the role of students in information and communication technology-based learning environment is changing and students are active in this process and are producing knowledge (8).Information and communication technology plays an important role in creating motivation, depth, expanding learning and sustaining it, relief of fatigue and malaise in students as well as mental skills to respond to questions from the students (9). Furthermore, information and communication technology is necessary in the educational system on one hand to rethink and restructure the curriculum, computer literacy, and on the other hand, for revitalization as well as enriching the learning environment and interaction for the learner and learning resources (10).

New education approaches are student-centered. In this approach, students will not be considered as empty vessels; they were born with knowledge, skills and attitudes that are in need of development through guidance, encouragement and motivation. Hence, the fact that the quality of education largely depends on the quality of facilities provided in the classroom, is undeniable. There is no doubt that information and communication technology has been established in today's school system. Computer as one of the main tools of information and communication technology is utilized, not only as a tool to help analyze school data, but also as a tool to optimize inclusive student's education (11).

One of the most common reasons cited for using this technology in classrooms is better preparation of the current generation of students for admission into the new environment of learning, so as to meet the educational needs and consequently future job requirements in the labor market. Due to traditional methods and time-consuming training, as well as the lack of updated information, teachers are not really able to prepare students for an ideal office environment. So, the use of information and communication technologies in classroom education can serve as the foundation for a competitive arm in a globalizing labor market. Thus, a person trained with open view and overall look can enter the global, political and educational market (12). Education should be a balance tool among the changes, innovations, and stability (13). Basically, how learning occurs must be noted. Certainly, our conception of good learning should be accompanied with the criterion; as a result, these criteria can't be achieved without a plan and previous plans. How can we move in the learning path, and do not plan to achieve it? Choosing a suitable plan causes the growth of learning and also has its usefulness. Learning loss, loss of students in academic courses,

selection of inappropriate majors, grade repetition, not reaching the realm of science production, and ultimately backwardness, are all the side effects of lack of appropriate programs in education (14). The ultimate goal of any education is deepening, accelerating and facilitating the learning process for the learners, based on the fact that the teaching-learning process is constantly changing and evolving. Educational plans have been key elements of any education system which always seek ways to accomplish this and with the help of educational planners should seek effective planning models for the success of this process. Hence, educational planning has been known since 1960 when systematic approach entered into education, particularly educational technology as a specialized institution determining the success of the training program and day by day its importance in the efficiency of education systems will be increased (15).

Academic achievement is considered as one of the most important indicators in evaluating education and all efforts were employed to fulfill this issue. In other words, the society and the education system in particular is interested and concerned about the successful development of students and their position in society and expects that, students in various aspects including cognitive, emotional and personality aspects and the acquisition of skills and abilities, find the progress and excellence they so desire. To achieve the academic achievement in students, it is necessary to have certain factors in mind. In this regard, one of the most important factors in academic achievement and in the general development of educational systems is, taking advantage of new educational approaches (16). E-learning is a novel approach in education which deals with providing learning opportunities for promotion, management knowledge and skills via the Internet and computer networks and converts the nature of education and learning as well as collecting the knowledge of teaching to learning (17). Thus, e-learning should be utilized beyond class lectures and materials, because a lot of innovation does not take place in the planning of distance learning. Nevertheless, any innovation must be scrutinized to assess its impact. E-learning is a combination of technology and education. The most significant role of educational planning is, linking these two concepts together. Educational designer must work to ensure that essential pervasive learning is the key to success in the world of technology. Educational designer plays a vital role in the successful planning of e-learning process. A successful e-learning depends on an effective educational design. Learning strategies in e-learning are not too different from traditional educational strategies. ADDIE model of educational plan has the required elements for qualitative learning, either for e-learning or traditional training. This pattern can be em-

ployed by a repeat and feedback approach as well as making technical changes and educational designs. This model is one of the best educational plan models, because of having basic principles of educational plan in addition to the simplicity. Basic principles include design, implementation and evaluation of educational plan models including other educational planning principles; although they may also have other details. So, given the general nature of the model, it can be utilized in all learning situations (18). This model was designed based on student-centered approach which considers the needs of students (19). Considering its general nature, the principles of cognitive theory were used in its design. They believe that students should be active in the learning process. In this model, since the general principles have been presented, the teacher has greater ability and flexibility and can apply it to any curriculum and add the details to meet educational needs, goals and objectives of teaching. Furthermore, teachers are free to choose any teaching method based on their teaching subject. In an overview, cognitive communication with educational plan helps the teacher to link new knowledge with prior knowledge of the students (20). In the analysis stage of this model, the teacher identifies the scope which is set to train it. In fact, this stage is all about identifying and assessing the situation so that it can be compared with the favorable situation and considers an appropriate plan for the existing gap (21). In this stage, the teacher determines the student's situation, need assessment is carried out and it identifies the student's level of knowledge and skills and the attainable level of knowledge and skills. This stage is a foundation and start for the subsequent steps. That is because at this stage, needs assessment is carried out and the existing situation will be identified. Furthermore, subsequent steps should be organized and identified according to the current situation. If you can't identify the accurate situation and detect the problems, the program may not be appropriately designed. In fact, design is a systematic approach for planning, development, evaluation and management of a learning process that involves all individual elements in educational plan (22). At the production stage, educational media and appropriate methods and test considered in accordance with the teaching positions will be determined. This stage provides tools and processes used to attain educational goals. This stage literally identifies how to achieve learning as well as being careful in choosing the media and educational strategy used; and this was conducted based on the audience, learning objectives and subjects. In the implementation phase, which was in the preceding three stages, is implemented in the classroom. If the implementation of educational planning in the classroom is not properly carried out, it implies that our plan has been performed to

this point as well. In addition to the planning carried out by teachers at the stage of formative assessment, students' performance in all stages of implementation and training was evaluated, hence, if there are problems due to the cyclical nature of this model, it can be fixed. At this stage, the evaluation is an important part of the work that which will be carried out at all stages of this educational planning models to determine the effect of education provided and the difficulties in the process of teaching and teacher's training method could be identified. This type of evaluation is a systematic process that specifies the quality and efficiency of educational planning at every stage, in addition to the final evaluation. The final evaluation stage is the procedure for determining the efficiency and effectiveness of training. Evaluation of educational objectives, methods and strategies occurs via data collection and feedback received from the students' performance. The final assessment evaluated the student's transferred knowledge, attitude and feedback, to determine if the desired results were achieved or if it should be redesigned or reconsidered and finally, whether educational planning could be able to fill the gap between the status quo that existed at the beginning of training, and desirable status and what is in teacher's consideration? (23).

In line with educational activities, interests and motivations are very important issues in the process of teaching - learning; because efforts of teachers and students to motivate and achieve learning will be futile. Generally, even if we implement the right plans and its components, regardless of the motivations and motivational components as well as educational planning, we will still be confronted with failure. It should be noted that in the plan for learning, motivation was chosen as a cause and reason for a behavior and was recognized as nurture objective and a prerequisite for educational activities (24). Students' attitudes towards various curriculum was due to their dream of success or failure with, English course as lessons whose contents have had logical order and its contents was provided in the order of simple to difficult. So, the issues located at the beginning of the book present the necessary cognitive readiness for the students to learn the future subjects. Along with this cognitive created in students, a positive attitude towards this curriculum as motivation readiness for learning should be created. Meanwhile, the responsibility of teachers besides teaching is the creation of positive attitude towards the lessons in the students, because teachers have the ability to modify the routine and boring exercises to interactive and enjoyable learning experience for students. Using various initiatives for English teaching skills to achieve this issue is effective. Currently, there is various educational software which were provided for the teachers based on the type of training but what

should be considered in the application of such programs is by considering their educational planning. Educational planning should be consistent with the age and the characteristics of the respondent, education content, duration of training and facilities. Moreover, the use of educational software because of time limitation and resources for all teachers and all courses are not possible. So, employing educational planning patterns, this problem can be partially overcome. Appropriate educational planning with education content can improve the quality of education. ADDIE planning model is one of such educational planning patterns. This model was planned based on the cognitive theory and, due to its positive features, including its completeness and comprehensiveness; it can be employed in any learning situation with regards to the characteristics of the audience and the content. We seek to create an extended learning environment not having the limitations of traditional learning environments such as limited numbers of learners, the courses' time and location, the teacher presence etc. In this modern educational system with contents of ADDIE planning model, learners without depending on education center, can actualize their potential. Thus, according to the above, this study aims to answer the question that, does ADDIE design pattern (analysis, design, production, implementation and evaluation) with e-learning approach have impact on achievement motivation of high school third grade students in English courses?

Accordingly, the following questions arise:

1- Does the educational planning model of ADDIE with e-learning approach have impact on achievement motivation of high school third grade students in English courses?

2- Does the educational planning model of ADDIE with e-learning approach have impact on confidence of high school third grade students in English courses?

3- Does the educational planning model of ADDIE with e-learning approach have impact on persistence of high school third grade students in English courses?

4- Does the educational planning model of ADDIE with e-learning approach have impact on the foresight of high school third grade students in English courses?

5- Does the educational planning model of ADDIE with e-learning approach have impact on diligenceing of high school third grade students in English courses?

2. Methods

This research is quasi-experimental with pre-test and post-test plans and test groups (educating considered curriculum based on ADDIE model with e-learning approach) and control (training considered curriculum with conventional teaching method). After the teaching, both experi-

mental and control groups were compared and the effect of this model was evaluated. The population of 2477 students was from third grade of district 1 in the city of Sari in the 2012 - 2013academic year. Hence, by multi-stage cluster sampling, public schools were chosen from different schools (public, private, community, etc.) in the first cluster, girl's schools in the second cluster were chosen among the public schools and in the third cluster, schools with facilities and electronic equipment were chosen among the girl's schools, while the fourth group was chosen among different fields of study, finally two classes with the size of 49 students were chosen among classes held in the experimental sciences field of study, which was randomly allocated to a class as the test group (n = 26) and another class as a control group (n = 23). All participants in the field of experimental sciences, who were studying in the third year of high school and the participants' presence in the sessions was purely voluntary. There were possibilities of leaving the sessions by participants in case of dissatisfaction at any stage. In this study, Hermans Achievement Motivation questionnaire was utilized (25). The questionnaire consist of 21 multiple-choice questions in which achievement motivation factors are: Confidence including items of 5, 10, 11, 4, 15, 20 and 21, perseverance including items of 1, 6, 12, 14 and 16, foresight, including the statements of 4, 7, 9, 17, 18, diligence including the statements of 2, 3, 8, 13 and 19. Akbari, using factor analysis, showed that the Hermans questionnaire comprises four factors of self-confidence, perseverance, foresight and diligence which implies that these four factors present 40.27% of the total variance. Calculating Cronbach's alpha coefficient, the reliability of the questionnaire was equal to 0.08. Higher scores illustrate higher achievement motivation while low score indicates lower achievement motivation. In this study, three chapters of the English book based on the ADDIE model of educational plan were designed with e-learning approach. After coordinating with the relevant teacher and familiarizing him with the mentioned educational planning pattern and designing curriculum content based on this model, educational multimedia software were carried out in six training sessions for the test group through the teacher. In addition to teaching based on this model in the implementation phase, control group in the same normal way were trained in a different class by the same teacher. At the beginning and at the end of both groups, pre-test and post-test were carried out. In order to analyze the data, ANCOVA test using SPSS 19 software package was utilized at a significance level of $\alpha = 0.01$. In this way, the pre-test and post-test scores of students in the experimental and control groups were compared. On the other hand, evaluation of the lack of correlation between scores (test × group) and more importantly an adjustment for pretest scores were the other

features of this test.

It should be noted that informed consent to participate in research was taken from all participants in this study. At the end of the study, results were presented to participants.

3. Results

Participants were 49 third grade high school girl students in the category of theoretical and experimental study. Before carrying out the covariance analysis test, it is necessary for variables to follow a normal distribution (Table 1). Table 2 shows that the data did not reject the error variance equality, in other words, the groups' variance is homogeneous. Table 3 also illustrates descriptive study of the impact of analysis planning pattern, design, production, implementation and evaluation with e-learning approach on achievement motivation of secondary school students in English courses.

Table 1 shows that the variables (achievement motivation and its components, i.e. self-confidence, perseverance, foresight and diligence) have a normal distribution (P> α = 0.01).

Table 2 shows that the assumption of homogeneity of variance of test and control groups for any of the variables is true (P > α = 0.01).

Table 3 shows that the average of achievement motivation and its components scores, i.e. self-confidence, perseverance, foresight and diligence in the control group has no significant change after the test. But in the test group compared to the pre-test, the post-test value of this rate has increased significantly. So, it seems that this significant increase has occurred as a result of the impact of the training curriculum based on ADDIE model with the e-learning approach on achievement motivation and its components in the test group.

Table 4 indicates a significant difference between the scores of achievement motivation and its components (confidence, perseverance, foresight and diligence) in the pre-test and post-test mode and in control and test groups (P < α = 0.01). As shown in Table 3, the average achievement motivation for the students in post-test and in the test group compared with the control group has increased significantly; since the participants were divided evenly in the control and test group (Table 2), differences generated were due to the impact of ADDIE planning model with e-learning training approach.

4. Discussion

The results revealed that students in the test group in post-test of the content planned based on ADDIE edu-cational planning model based e-learning, based on educational planning model with the same content trained with traditional methods had better performance than the control group. It can be argued that this method has increased achievement motivation, self-confidence, diligence and academic achievement of students in English courses. The results of this study are in line with the results of Mojtahedzadeh et al. (26), Rastegarpour et al. (23), Salimi (27), Seraji (28), Tsai and Junks (29), Lee (30), Almkhlafy (31), Chankung (32), Hillary (2000; quoted in Pourjamshidi (33) and, Desi et al. (34). All researchers considered the use of multimedia software to generate interest and attitude change in effective learners. Moreover, students have gained more academic achievements enjoying these features, and these tools have also improved students' English language skills. If the results of this study and similar studies confirm the effectiveness of E-learning and educational planning models in the teaching and learning process, there would be no doubts and concerns on the use of multimedia in education. In summary, the results of research supported by previous studies can be presented in these terms that, E-learning can transform the learning environment, makes it attractive, attracts students and learners in the learning process, amplifier stimulus are injected into the process of teaching and learning to improve educational quality and also increase the incentive for students to learn the lessons. By increasing motivation, students' efforts to learn more are increased and as a result, their scores get better. Increased motivation and high scores led to a positive attitude about themselves and their abilities and also led to the creation of positive self-concept. Since electronic devices (multimedia) are able to optimize the teaching and learning process as well as provide a rich and varied educational environment, our education system should make a difference in the process of teaching and curricula using it properly. Multimedia software can be useful as a teaching tool in all phases of educational issues, as they have powerful and potential abilities to optimize the educational affairs.

Footnotes

Authors' Contribution: We ask authors to describe what each author contributed, and these contributions to the work may be published at the editor's discretion. Example: Author Contributions: Study concept and design, Fortes, Melchi, and Abeni; analysis and interpretation of data, Fortes, Mastroeni and Leffondre; drafting of the manuscript, Fortes; critical revision of the manuscript for important intellectual content, Mastroeni, Leffondre, Sampogna, Melchi, Mazzotti, Pasquini, and Abeni; statistical analysis, Fortes and Mastoeni. Example: Yoon Kong Loke

Table 1. Kolmogorov-Smirnov Test to Assess the Normality of Study Variables

Variables	Tests	Test group			Control Group		
		No.	K-S	P Value	No.	K-S	P Value
Self confidence	pre-test	26	0.083	0.200	23	0.146	0.200
	post-test	26	0.150	0.200	23	0.122	0.200
Perseverance	pre-test	26	0.110	0.200	23	0.104	0.200
	post-test	26	0.171	0.093	23	0.151	0.200
Foresight	pre-test	26	0.090	0.200	23	0.125	0.200
	post-test	26	0.144	0.200	23	0.135	0.200
Diligence	pre-test	26	0.083	0.200	23	0.146	0.200
	post-test	26	0.137	0.200	23	0.114	0.200
Achievement motivation	pre-test	26	0.110	0.200	23	0.104	0.200
	post-test	26	0.149	0.200	23	0.140	0.200

Table 2. Levine Test to Check for Equality of Variances

Variables	Tests	Levene's Test		
		No.	F	P Value
Self confidence	pre-test	23	0.096	0.759
	Post-test	26		
Perseverance	pre-test	23	2.287	0.137
	Post-test	26		
Foresight	pre-test	23	2.395	0.128
	Post-test	26		
Diligence	pre-test	23	2.187	0.146
	Post-test	26		
Achievement motivation	pre-test	23	1.046	0.312
	Post-test	26		

Table 3. Descriptive Assessment of the ADDIE's Effect on Achievement Motivation and Its Components

Variables	Groups	Tests	No.	Average	Standard Deviation
Self confidence	Control group	pre-test	23	3.37	0.44
		post-test	23	3.42	0.43
	Test group	pre-test	26	3.45	0.49
		post-test	26	3.83	0.18
Perseverance	Control group	pre-test	23	3.38	0.31
		post-test	23	3.40	0.31
	Test group	pre-test	26	3.50	0.50
		post-test	26	3.85	0.18
Foresight	Control group	pre-test	23	3.38	0.31
		post-test	23	3.40	0.31
	Test group	pre-test	26	3.40	0.51
		post-test	26	3.81	0.20
Diligence	Control group	pre-test	23	3.38	0.31
		post-test	23	3.40	0.31
	Test group	pre-test	26	3.32	0.49
		post-test	26	3.80	0.19
Achievement motivation	Control group	pre-test	23	3.38	0.33
		post-test	23	3.41	0.33
	Test group	pre-test	26	3.42	0.42
		post-test	26	3.82	0.17

Table 4. ANOVA Test to Investigate the Effects of ADDIE on Achievement Motivation and Its Components in Students

Variables	Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F	P Value
Self confidence	Pretest score	3.015	1	3.015	73.041	< 0.001
	Studied groups	1.638	1	1.638	39.679	< 0.001
	Error	1.899	46	0.041	-	-
	Total	6.956	48	-	-	-
Perseverance	Pretest score	1.532	1	1.532	53.276	0.001p <
	Studied groups	1.821	1	1.821	63.324	< 0.001
	Error	1.323	46	0.029	-	-
	Total	5.236	48	-	-	-
Foresight	Pretest score	1.690	1	1.690	58.071	< 0.001
	Studied groups	1.926	1	1.926	66.205	< 0.001
	Error	1.338	46	0.029	-	-
	Total	5.013	48	-	-	-
Diligence	Pretest score	1.728	1	1.728	61.559	< 0.001
	Studied groups	2.212	1	2.212	78.803	< 0.001
	Error	1.291	46	0.028	-	-
	Total	4.967	48	-	-	-
Achievement motivation	Pretest score	1.791	1	1.791	63.572	< 0.001
	Studied groups	1.899	1	1.899	67.436	< 0.001
	Error	1.296	46	0.028	-	-
	Total	5.172	48	-	-	-

developed the original idea and the protocol, abstracted and analyzed data, wrote the manuscript, and is guarantor. Deirdre Price and Sheena Derry contributed to the development of the protocol, abstracted data, and prepared the manuscript.

Conflict of Interests: To prevent the information on potential conflict of interest for authors from being overlooked or misplaced, mention this information in the cover letter. Authors must identify any potential financial conflicts of interest before the review process begins. Declared conflict of interest will not automatically result in rejection of paper but the editors reserve the right to publish any declared conflict of interest alongside accepted. The following would generally be regarded as potential conflicts of interest: 1- direct financial payment to an author for the research or manuscript production by the sponsor of a product or service evaluated in an article. 2- Ownership of shares by an author in the company sponsoring a product service evaluated in an article (or in a company sponsoring a competing product). 3- Personal consultant for companies or other organizations with a financial interest in the promotion of particular health care products and services.

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