

The effect of online personalized education on achieving meaningful learning outcomes of Iranian EFL learners

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Abstract

The aim of this study was to investigate the effect of online personalized education on achieving meaningful learning outcomes of Iranian EFL learners. Personalized education has been introduced as a new approach to use in education in the 21st century. The method of the present study was quasi-experimental with pretest-posttest control group design. The statistical population in this study included all advanced level students in English department at Maad Higher Education Centre of Shiraz which 30 of them were selected by convenience sampling method and were randomly assigned in experimental and control groups. In order to provide concepts to the experimental group, the Moodle online training platform was used which is designed for online training. A questionnaire was designed taking into account the principles of meaningful learning in the field of grammar. Before and after the personalized education, control and experimental groups answered the questions. The obtained pre and post-test scores were used to data analyze. In this study, descriptive statistical indices (such as mean and standard deviation) and inferential statistical methods such as multivariate analysis of covariance were used to test the significance of the differences between the control and experimental groups. Based on the results of the analysis, effect of online personalized education on achieving meaningful learning outcomes of Iranian EFL learners was significant.

Keywords online personalized education, meaningful learning outcomes, Iranian EFL learners

1. Introduction

Personalized learning has been a topic of research for a long time. However, around 2008, personalized learning started to draw more attention and take on a transformed meaning as seen in . As of 2018, almost 5,000 articles have been written about personal learning. (Shemshack, 2020) Personal learning is not a new concept, but the advent of classroom technology has made it easier for educators to develop and deliver such student-centered lessons. Education is a complex process that any simplification about it can lead to wasting resources and efforts and fail. The purpose of training is to facilitate learning. Learning can be defined in many ways. Learning is related to acquiring new ideas, different habits, various

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skills and different ways of solving problems (Cakula & Sedleniece, 2013), but formal, one-size-fits-all education is often unproductive and has little influence on practice. (Lefstein et al., (2020), Evans, (2019)) In addition, from 2020, teachers needed to develop more and different professions in their teaching environments because they were called to teach online, and this phenomenon was due to the COVID-19 epidemic. (An et al., 2021; Darling-Hammond & Hyler, 2020). Learning is a relatively constant change in mind or behavior that occurs during experience and does not involve changes due to instincts or fatigue. By examining learning theories, it can be seen that in these theories, the characteristics of individuals have been considered differently and the two approaches of epistemology and more constructivism have considered individual differences. Usually for learners who are in the first stage of education, the cognitive attitude is recommended to have more control over them. In contrast, a constructivist approach is used for learners with more learning experiences (Ouf et.al, 2017) science attainment, application and maintenance are the primary building blocks of competence. .) Loomis et al 2022) Peltokorpi et al, (2022) There is meeting among psychologists that hand of human cognition always results in forgetting. Cognitive interposition depends on the content presented at each time point to a human whose proletarian memory is limited. In practice, when a learner cannot attract all the information, a working retention overload is practiced. (Peltokorpi et al, (2022)) One of the fundamental areas of psychology is the study of individual differences in human behavior. Every human being is a mixture of intellect, logic, excitement and emotion. People also experience a variety of learning methods depending on their individual differences (Yildirim& Zengel, 2014). For example, a study was conducted on urban and rural populations that showed that urban populations showed more diversity in bold and aggressive behavior, that is, urban people had more differences in their behavior than rural people, regardless of any interpersonal diversity. (Merten et alm 2022) Their learning power depends on the way in which they absorb and process information. Some learners are interested in focusing on facts, documented information, and mathematical calculations (Palmiero et.al, 2016). According to Park (2022) revealed that the interconnections between language and surrounding society are deeply embedded in his English language learner identity formation. Others are interested in mathematical patterns and their complexities and theories. Others emphasize visual forms such as images, diagrams, and maps. Many of them express information verbally and in writing and others memorize things by interacting with and interacting with them (Yang et.al, 2013). Research findings have shown that coordinating educational materials and resources to meet the diverse learning needs and interests of learners can be effective for them. To achieve this, there must be a thorough knowledge of the learner (Khudhair Abbas, 2016). Each person has motivations, goals, experiences, trends, content, interests and other characteristics in their learning process, which distinguish their learning from others. In addition, previous studies have also shown that the outcome of training is not the same for all learners, and in most cases, training courses fail after a long time and high costs. Education users differ in individual characteristics such as level of knowledge, speed of learning progress and learning goal and if the

educational system chooses the method of teaching the content according to the comprehensive features and offers it to him, it will have significant impact on improving the quality of education (Mangaroska et.al, 2019)

In the learning system, learners have different conditions including background knowledge, age, experiences, cultural background, motivation and goals. Accordingly, personalization of learning is considered very necessary in order to increase the efficiency of education (Labib et.al, 2017). The results of Ingkavara et al.'s (2022) research also showed that students' perceptions of the usefulness of learning suggestions, ease of use, goal setting, learning environment structure, task strategies, time management, self-assessment, basic learning, and attitudes toward the learning environment are key predictors. The idea of personalization about education can be traced back to the nineteenth century, when Helen Parkhurst developed the Dalton plan in which each student could plan his or her own curriculum to meet his or her needs, interests, and methods. Since then, the idea of personalizing education has evolved to promote independence and reliability to enhance students' social skills and a sense of responsibility to others (Hoffler et.al, 2017).

The COVID-19 epidemic has made compulsory e-learning mandatory in countries. It remains unknown to what extent developing countries such as India (with widespread socio-economic and cultural diversity) are prepared for this challenge. (Singh,2021) E-learning seems to be a good alternative to face-to-face training for Lyme disease. It seems to be more effective than face-to-face training for the acquisition of theoretical knowledge. The script concordance test evaluation of know-how did not show any difference between the two learning methods. (Gaudin, 2022)

On the other hand, e-learning is a method that is used to design, deliver lessons and implement the educational environment with the aim of achieving and continuing learning and its main purpose is complete self-education of the learner through the network. One of the most important advantages of this training is that it is possible for people to learn anytime, anywhere. E-learning is more cost-effective than e-learning, because it requires less time and money (Huang, 2016). Continuing to learn and try new methods of communication will aid in improved learning and foster teacher-student respect and collaboration. (Tîrziu et al 2015)

Therefore, the realization of learning in the educational system depends on providing a learning-oriented environment and independent of time and place. Due to the unique characteristics of each learner, the existence of a personalized mechanism to help effective learning in the learner is one of the requirements of the e-learning system. Therefore, in designing these systems, it is necessary to pay attention to the learner's preferences, interests, effective personality traits in learning, educational behaviors and cognitive characteristics, in order to provide a personalized strategy to aid learning (Laksitowening & Hasibuan, 2016). Personalized education is about adapting the educational aspects, curriculum and learning environment to meet the learning needs and styles of each learner. Personalization of learning, instead of assuming all learners to be the same and providing the same training to all, as in face-to-face teaching, Learners are seen as a set of people who are different from each other And education should be provided

to each individual in a way that is unique to him or her. Various dimensions such as behavior, knowledge, inclinations and preferences have been implemented in personalization (Drachsler et.al, 2015).

Current grasp defines teaching as an emotional, relational, ethical and innovative vocation. (Kostiainen et al, 2018) The main findings of Al-smadi study (202) showed that students' satisfaction and evaluation of e-learning experience during the epidemic was not promising.

Therefore, to provide personalized education in e-learning systems, first step is to identify the features that should be considered in designing educational strategies in the learner model. The characteristics of the learner model are divided into three categories: cognitive, emotional and motivational (Al-Rajhi et.al, 2014). Cognitive characteristics depend on the learner's fixed characteristics, including: working memory capacity, IQ, personality and cognitive style, and learning style. Emotional characteristics include emotional states that must be answered correctly so that the learner's motivation to learn is not lost and motivational characteristics are the items that are necessary to pay attention to in determining the educational strategy appropriate to the learner, as the main goal of intelligent educational systems (Bernald et.al, 2017).

Findings Research by Zamecnik et al. (2022) shows that the learner faces unique study challenges, as well as unique opportunities for each individual that can be used to improve learning outcomes. The practical implications of the study are further discussed in teaching methods. This characteristic includes motivation, learner goals, self-efficacy, learner's knowledge and goal orientation. The individual characteristics of the learner, each alone or a combination of them, have been considered by researchers in designing an intelligent educational system and in order to personalize it. Learner knowledge is one of the effective factors in learning in learner modeling and its display is possible through learner evaluation. In personalized platforms, knowledge assessment and consideration provide consistent learning materials and are an effective factor in arranging appropriate content for each learner. It can also enhance personal learning performance and increase the effectiveness of learning and academic achievement (Hasibuan et.al, 2019).

The results of Sun et al.'s (2020) study showed that EFL students reported moderate levels of self-efficacy and infrequent use of SRL strategies during the writing period. In addition, both SRL and SRL writing self-efficacy strategies significantly contributed to the prediction of students' writing skills. Because self-efficacy and self-regulation are critical to students' writing skills, the current study provides classroom teachers with insights on how to combine guidelines in EFL classes to improve student writing results.

The rest of the present study is organized as follows: First, a brief explanation of personalized education and meaningful learning is provided. The following is the method of research and analysis of data and finally the discussion and conclusion of the presentation.

1.1. *Personalized education*

Personalization of education can be considered as an evidence-based approach in educational practice. A personal education system is designed to analyze specific learning abilities, learning requirements, and study objectives. (Bhutoria, 2022)

Personalization can be defined as the ways in which information and services are tailored to the unique and specific needs of an individual or a community. The subject of personalization is not limited to learning and teaching, but personalization makes sense in any system of interaction with individuals. But if we consider personalization in a particular subject of learning, a new meaning is formed which arises from the characteristics and effective elements in this field (Barney & Fisher, 2016). Personalized education is about adapting the educational aspects, curriculum and learning environment to meet the learning needs and styles of each learner. Personalized education, rather than assuming all learners are the same and like teaching in the traditional way, to provide the same education to all people, learners are considered a set of people who are different from each other and education should be provided to each individual in a way that is unique to him or her (Tieu & Bui, 2016). The throughout idea of personalization is to tailor contents to known wishes and needs of a specific user – related witting is stored in a user model that is used to analogize which items such as products, services or units of information should be shown to a user. (Tiihonen, 2017)

They realize various dimensions of personalization, such as: personality, behavior, knowledge, inclinations (interests) and preferences. Each dimension must be described in some way. To describe the personality dimension, the learner's profile and learning style, knowledge dimension, attention to previous and background knowledge, behavior dimension through learner performance, learner's tendencies, and learner interest preferences are studied. . Personalization in e-learning is the use of technology and learner features for a tailored interaction between the learner and the learner, so that each learner achieves better learning outcomes (Rollande and Grundspenkis, 2017).

In reality, personalization is not a new sense in the education department. Terms such as personalizing, matching, or tailoring of educational content have been used interchangeably upon time to recognize and better understand the heterogeneity amid learners with peculiar problems so as to prescribe remedial interventions more precisely. (Cook et al., 2018).

1.2. *Meaningful learning*

Transition from traditional in-class teaching to distant learning, whether full or blended, is an inevitable step. (Bani et al. 2021) Meaning depends on the existence of some kind of symmetry or mental equivalent in cognitive construction. That is, when a concept can be related to concepts that already exist in a person's cognitive construction, that concept is meaningful. In other words, meaningful content is related to what has been learned before, while non-meaningful or superficially learned material is accumulated in the mind in a scattered and unrelated way. Shank (2000)

has argued that learning is meaningful when new material expands or alters previously learned material. Previous experiences therefore determine whether learning is meaningful to students (Bendall et.al, 2016). Angela's study (2014) stated that learning outcomes are demonstrated by meaningful learning or textual learning given how acquisition-related and structurally organized acquisition is (i.e., how new acquisitions are integrated into learner cognitive structures; and How they relate to previous cases).

In order for learning to be constructively meaningful, learning should be active, constructive, intentional, authentic, and cooperative. When the learner begins to reflect upon the learning object or the problem, the learning becomes meaningful. When the technology is engaging and facilitating the learner, then it helps meaningful learning. Technology supports meaningful learning by representing the ideas, understanding and believes of learners, producing organized knowledge by multimedia tools, by providing access for the needed information, by helping to compare ideas and world views, by representing the real world problems and contexts and thus achieving the authenticity, also simulating them, by representing the views of others, by defining the problems for learner thinking, by helping collaboration with others, by building consensus among the members of the community by discussing and arguing, by supporting the discourse among knowledge-building communities, by helping articulate and represent what they know, by supporting the construction of the personal meaning, and supporting by mindful thinking(Ari& Ataizi, 2016). Also, the results of research by Liu et al. (2021) showed that 1. self-centered perfectionism does not directly predict English language burnout in the context of mobile learning, but this relationship is mediated by generosity and language learning anxiety. 2. Self-centered perfectionism positively predicted generosity, while generosity negatively predicted English learning anxiety. 3. Great predicted a decrease in academic effectiveness in learning English on a mobile phone.

1.3. Research hypothesis and research question

There is a significant relationship between the effect of personalized online education and achieving learning outcomes among Iranian English language learners.

What is the effect of online personal training on achieving meaningful learning outcomes for Iranian English language learners?

2. Methodology

The present research method was quasi-experimental with pre& post-test control group design. Researchers often use quasi-experimental designs when random selection is not possible or appropriate. In this study, the experimental and control groups were measured, before the start of the training and after the end of the training. Accordingly, the experimental group received training on a personalized platform, while the control group was not given any training. Next, the study population, the process of doing the work and a scale used to collect information and how to do the work

were mentioned. The statistical population in this study included advanced level students in English department at Maad Higher Education centre of Shiraz which 30 of them were selected by convenience sampling method and were randomly assigned two to experimental and control groups. In order to provide concepts to the experimental group, the Moodle online training platform was used which is designed for online training. The reason for using this platform was the experience of students using this software. A questionnaire was designed taking into account the principles of meaningful learning in the field of grammar. Before and after the personalized education, control and experimental groups answered the questions. The obtained pre and post-test scores were used to data analyze. In this study, descriptive statistical indices (such as mean and standard deviation) and inferential statistical methods such as multivariate analysis of covariance were used to test the significance of the differences between the control and experimental groups.

The principles of meaningful learning are also derived from the theory of constructivism. These principles are:

Principle 1: In the classroom, it is necessary to pay the most attention to the ideas, objections and mental ambiguities of students.

Principle 2: It is necessary to select topics for teaching in the classroom, which are completely related to the past and present experiences of the student.

Principle 3: The teacher and the curriculum should help students find that the subjects are valuable.

Principle 4: In the classroom, it is necessary to select topics for study and learning that are useful for the daily life of human beings.

Principle 5: We must ensure that the subjects taught in the classroom are deeply understood.

Principle 6: We should strive to provide the classroom with opportunities for each student to share their experiences and ideas with other students.

Principle 7: We should not only pay attention to the cognitive dimension of issues, but also help students discover other aspects of social life and the curriculum through class activities.

Principle 8: It is necessary to select topics and activities to be implemented in the classroom that have the characteristics of integration and students understand a single meaning from all of them (Wan & Niu, 2016).

A questionnaire was designed for determining meaningful learning level by the researcher considering the content of the lesson in the field of grammar topics. Control and experimental groups answered the questions, before and after the personalized training. The obtained pre-test and post-test scores were used to analyze the data. The research design is presented in Table 1.

Table 1
Research plan

	Post-test	Independent variable	Pre-test	Random selection
Experimental group	T ₂	X	T1	NR
Control group	T ₂		T1	NR

In this study, descriptive statistics indices (mean and standard deviation) and inferential statistical methods including multivariate analysis of covariance were used to test the significance of the differences between the control and experimental groups. To test the research hypothesis, multivariate analysis of covariance (MANCOVA), which is one of the strongest and most appropriate methods of analysis in behavioral science research, was used to show the effect of personalized education on dependent variables (meaningful learning). In this type of analysis, in the first step, the presence or absence of significant linear composition of dependent variables is examined based on the independent variable. And in the next step, after separating the dependent variables, their analysis is studied at the levels of independent variables. In other words, the results of such an analysis can explain whether the independent variable affects the linear composition of the dependent variables. In this study, SPSS 23 statistical software was used to analyze the mentioned cases.

3. Findings

First, meaningful learning was compared between the experimental and control groups before training. Table 2 shows the comparison of mean and standard deviation of meaningful learning in the experimental and control groups

Table 2
Comparison of mean and standard deviation of meaningful learning in experimental and control groups

meaningful learning scale	experimental group		control group	
	Mean	standard deviation	Mean	standard deviation
meaningful learning	45.2667	1.75119	42.3333	2.38048

According to Table 1, amount of meaningful learning scores in both groups before personalized online education are not different from each other. Here, the level of meaningful learning in the experimental and control groups after training is compared.

Table 3
Comparison of mean and standard deviation of meaningful learning in the two groups of control and experiment after training

meaningful learning scale	experimental group		control group	
	Mean	standard deviation	Mean	standard deviation
meaningful learning	54.8000	1. 53375	43.2667	1. 17781

According to Table 3, it can be said that the meaningful learning mean is different in the two control and experimental groups after training and the level of meaningful learning in the experimental group has increased and due to online personalized education, is above mean while in the control group has not changed much.

In order to select the appropriate statistical tests, in the first step, we must examine the scale and status of the data distribution of each variable. The scale of the data obtained in this study is distance. We also use the Shapiro-Wilk test to check the normality of the obtained data distribution. The results of this test are presented in Table 4.

Table 4
Shapiro-Wilk test results (examining the normality of data distribution of variables)

	test statistics	Degrees of Freedom	significance level	data distribution
pre-test meaningful learning	0.973	30	0.616	normal
Post-test meaningful learning	0.932	30	0.0830	normal

As shown in Table 4, the results of the Shapiro-Wilk test show that the distribution of the data is normal for research variable. Accordingly, we can use parametric tests in analyzing the results of this study.

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3.1. Assumptions of research hypothesis

In comparing the results obtained from the post-test of meaningful learning between the two control and experimental groups, the pre-test performed by these two groups can affect the results of the post-test. Therefore, to eliminate the possible effect of pre-tests from post-test results and to compare the results of two post-tests by removing the effect of pre-test, we use the analysis of covariance test. The covariance test has assumptions such as the normality of data distribution and the assumption of equality of variances. Table 5 presents the homogeneity test of variances for pre-test and post-test of the two groups.

Table 5

Levene's test to determine the equality of variances

Levene's statistics	Degree of freedom	Second Degree of freedom	significance level
.032	1	28	0.850

As shown in Table 5, the Levin test for the equality of variances shows that it is obtained based on the significance level value and if they are greater than the numerical value of 0.05, there is no significant difference between the variance of pre-tests and post-tests. Therefore, the assumption of equality of variances is confirmed as the default of covariance test. The second assumption of the covariance test is the homogeneity of the regression line slope of the two groups of tests. The following results show an examination of this hypothesis.

Table 6
Covariance test for homogeneity of regression line slope of pre-tests for two groups

reference	sum of squares- Type III	Degree of freedom	mean square	F	significance level
Interaction of group variables and pre- test	45.490	1	45.490	2.130	0.156

As shown in Table 6, the significance level obtained from the interaction of group variables and the pre-test (0.156) shows a value greater than 0.05, which confirms the homogeneity of the regression slope of the pretest of the two groups. Therefore, this assumption is also confirmed as the default of covariance test. In order to compare the mean values of the post-test of the two groups, we use the multivariate analysis of covariance (MANCOVA) test. The results of this test are presented in Table 7.

Table 7
Analysis of covariance to compare the mean values of post-test of control and experimental groups

reference	sum of squares- Type III	Degree of freedom	mean square	F	significance level	eta square
remainder	407.693	1	407.693	18.321	0.001	0.404
group	0.534	1	0.534	0.024	0.038	0.001
Pre-test	68.905	1	68.905	3.096	0.362	0.103
Error	600.829	27	22.254			
Total	72896.0	30				

As shown in Table 7, the results of covariance analysis show that there is a significant difference between the mean of the meaningful learning post-test in the control and experimental groups. In other words, based on the level of significance obtained for the group variable (0.038) and considering that it is not larger than the 0.05, it can be concluded that at the 95% confidence level, the difference between the meaningful post-test mean of the two groups (control and experiment group) is significant. Accordingly, personalized online education has affected students' meaningful learning.

4. Discussion and Conclusions

E-learning is a method for using information technology to design, provide lessons and implement educational environments with the aim of achieving and continuing learning. Its main purpose is the complete self-learning of the learner through the network, achieving knowledge in this educational system depends on providing a learning-oriented environment independent of time and place. One of the requirements of e-learning systems is the existence of a personalized mechanism to help effective learning. Personalized education provides the same training to all people. Learners are seen as a set of people who are different from each other and education should be provided to each individual in a way that is unique to him. The main purpose of this study was to investigate the effect of online personalized education on achieving meaningful learning outcomes of Iranian EFL learners. Based on the results of research analysis, the effect of personalized education on meaningful learning of students was significant. Therefore, the research hypothesis was confirmed and in other words, it can be said that Personalized education has been effective on students' meaningful learning. These findings of this study, are consistent with the findings of Jones (2009), Jones, Ruff, Snyder, Petrich, and Konke (2012); Jones et al. (2012); Jones et al. (2013); Curtio (2015); Lee et al. (2016). In explaining these findings, it can be said that the appropriate curriculum and according to the principles of meaningful learning in the personalized platform for learning, is a program that provides appropriate conditions and conditions for observation and semantics for students. In this program, in order for each student to succeed in creating meaningful knowledge in their mind, it is necessary to personalize the learning situation according to their level of personality development. The pre-organizer teaching model can be used in any educational content where the basic concepts and theories are presented in a field and the contents have a more logical course. It is also useful when we want learners to gain a unified and general knowledge of the content at the end of the course. Ultimately, it is the student who builds his knowledge. Learning is a process that the student has to go through, and the force that drives him or her to try is an intrinsic motivation (such as the need to gain new experiences). Therefore, the main role is played by the student. In other words, meaningful learning theory is a student-centered theory. According to the research results, it is recommended that the principles of personalized education be embedded in online education platforms with the help of experts in various fields in order to achieve meaningful learning among learners.

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