

**The Identification Effective Factors on Blended Learning Development
In Higher Education Context****Dr. Sana Safari**^{*1}Assistant Professor of Education Management, faculty of educational sciences, Payam Noor
University**Received:** 2020/05/02**Accepted:** 2021/02/14**Abstract**

This study aimed to identify effective factors to the development of blended learning from the perspective of faculty members of PNU. The method was descriptive and survey research. Sample size was determined 198 using Morgan table by simple random sampling. For this purpose, after the study of contemporary research findings, effective factors to the development of blended learning were divided in five groups of structural, planning, information systems, nature and workplace and support factors for each of these components were determined. In order to assess the effective factors to the development of blended learning from the perspective of faculty members, a researcher-made questionnaire was designed. The questionnaire was with 40 questions using a Likert scale. Its validity was confirmed through content validity by Education specialists and its reliability through Cornbrash's alpha ($\alpha=91\%$). After determining the sample size, questionnaires were distributed to faculty members. The research findings were analyzed using exploratory and confirmatory factor analysis. To analyze the data, SPSS and LISREL soft wares were employed. Results indicate that among the identified factors, the most important and influential factors to the development of blended learning from the perspective of faculty members was related to structural factors.

Keywords

Blended learning, Development, Higher Education , Structure.

Introduction

Blended learning is a relatively new term, but its meaning has existed for decades in areas such as virtual education [1]. First generation included correspondence education using one-way teaching methods and tools such as e-mail, radio, and television; Was computer-based and third-generation, Blended learning, as a way to maximize the benefits of face-to-face learning and multi-technology is described for training [2]. Therefore, blended learning is growing rapidly in both industry and education, and most educational institutions and organizations are using the blended learning approach to provide better services to their learners [3]. Blended learning is also referred to as hybrid education or mixed education [4]. And in general, there are many definitions of this term that combine education as a deliberate integration of e-learning and face-to-face education.[5].

Blended learning can be described as a training program in which more than one method of presentation is employed to optimize training outcomes and cost effectiveness [6]. In addition, blended learning is used to describe teaching activities based on various events such as face-to-face education, live e-learning, and self-directed learning [7]. Blended learning is also defined as the effective combination of different techniques and how to deliver different training to meet specific communication, knowledge sharing, and information needs [1]. Access the information available on the web and use it when needed .Roosevelt & Farage, stated that blended learning has seemingly conflicting approaches such as formal and non-formal education, online business, and face-to-face teaching. Face, guided and self-directed paths, digital resources, and faculty

communication combine to achieve Organizational and individual goals.[8].

Bressin defines blended learning as a combination of different media (technologies, activities, and types of events) to create an optimal curriculum for specific audiences [9]. Others define blended learning based on the amount of educational content delivered online as well as the amount of content that is face-to-face, for example Sloan Consortium, which states that the educational content delivered online in blended learning, it should be between 20 and 79 percent [4].

Procter has introduced a relatively comprehensive definition of blended learning by adding the dimension of teaching and learning styles. Since this definition encompasses both the teaching dimension and the teaching styles, it is a relatively comprehensive definition of blended learning, but it has provided the broadest definition of blended learning in Driscoll (2002), in his view of blended learning according to different goals.[10]. There are 4 different definitions: Combining web-based technology approaches to achieve educational goals 2- Combining different pedagogical approaches to optimally produce educational data with or without educational technology 3- Combining any form of educational technology with face-to-face education 4 - Combining educational technology with tasks .The real job is to create a harmonious impact between education and work [11].

The theme of blended education is that not everyone learns the same way. Therefore, it seems necessary to use different methods for teaching .Blended learning is thoughtful combination of e-learning such as online learning, multimedia and face to face training activities in the classroom. This new approach is currently applied in many large and successful companies such as IBM . As can be seen from the definitions above, blended learning programs may include a variety of forms and tools of instruction such as virtual classes, real-world use of instructional software in the teaching process, self-improvement modes, based courses. On the web, electronic systems support is combining the task environment with the knowledge management system.

Blended learning is a set of learning events that are arranged to achieve broader and better learning goals [12] as well as the focus of blended learning on achieving optimal learning goals. Applying appropriate technology for adapting to learning styles is appropriate for transferring knowledge and skills at the right time [6].

Blended learning as a new approach in the education system is considered as a source of information for better achievement of the educational goals and is considered as a fundamental presentation of educational system to achieve goals and objectives in the education system.

People such as Hong, Ma [12], Huick Bozick, Vernar & Boutique Zohang[13] Bowles, Goodyear & Ellis [14], Hang & Zoo [15] believe that the purpose of Blended learning is simply to incorporate online learning. Traditional courses are not face-to-face and the use of blended learning is not seen as merely a tool for the higher education system; rather, it is considered as a fundamental choice with the educational system. For this reason, the purpose of blended learning is to redesign the curriculum. , to achieve goals that cannot be achieved through online and virtual learning or face-to-face learning.

According to literature review on blended learning, there is no general consensus on the definition of blended learning. Various educational institutions have provided specific definitions and typologies to describe the blended learning approach. This lack of unique definition makes it difficult for educational institutions to accept and apply a definition that they find appropriate for their own application [16].

Al-Badawi and Ali Jani , in a study entitled "Does E-Learning Increase Employee Productivity?" They examined the effectiveness of e-learning on internal factors (creativity, management, satisfaction, and productivity) and external factors of employee productivity. The results of the research confirm that the attention of senior managers of the organization to the internal factors of productivity, improves the external factors of employee productivity. The

study found that the impact of applying this system significantly improved individual performance along with the creation of new ideas and designs employee productivity in all dimensions.[17].

Majd Taymori considers blended learning as a continuous process that combines different levels and different approaches in a specialized manner. This method enables to balance the training and progress of the program and to achieve the desired goals. The main advantages of using this training method are cost savings and quality of training and the key benefits of adapting it to the needs. It is a unique and resourceful approach to achieving educational goals along with combining classroom activities with instructional leadership and educational flexibility to empower and encourage participation. [18].

In the research of Sue and Cut , the relationship between the use of blended learning, student perceptions of participatory learning and its success in providing educational materials was examined. In this program, 48 students were asked to present a blended learning model in community health and increasing student baseline information about AIDS and prevention was used. Students were assessed through a questionnaire of student perception and interview. The results showed that there is a positive relationship between student perception of participatory education and ability to present lessons learned in public .There is a significant increase in satisfaction with education. It creates a better sense of education for students; it means that participatory education using a blended learning paradigm enables more effective learning and enhances students' satisfaction with education. The structure of the unit offered the psychological support for students, and the use of multimedia equipment are related to students' understanding of participatory instruction, content delivery, and student satisfaction.[19].

Kichenham's study, Adult Learning, Technology, and Early Childhood Learning, was conducted with the aim of examining external factors affecting the success or failure of blended learning in elementary school educators. The results of the study showed that cooperation, strong infrastructure and coach demand are factors that influence the success of blended learning and the three factors of poor infrastructure, inadequate time and limited resources are the factors that impede learning.[20]

In another study aimed at investigating teachers' perceptions of blended learning and ICT-based approaches, four questionnaire forms were used to examine the process of education, facilitator support, materials and tools, experiences of participatory education, and technology productivity. The results showed that teachers' perceptions and knowledge of new educational findings had increased [21].

Others examined the different dimensions of the combination of the two methods of face-to-face teaching and online teaching, and its effect on coordination and success. Putting the teaching method on the four major axes knows the content and structure presented later on, teaching-learning strategies, interaction between learners, and the metacognitive to be included [22].

Motteram (2006), with the aim of examining blended (traditional and online) teacher education, found that this type of training is a kind of balancing and reviewing skill program and enhances the skills that were previously developed.[23].

In another study conducted by Al-Daqadi and Nawabi to evaluate the effectiveness of participatory method in blended learning on Egyptian teachers, the effect of education on the basics of education, their attitude towards e-learning and participatory education was investigated. Significant improvement in the level of competence and understanding of trained teachers was achieved through this educational approach .Change in attitudes of individuals towards e-learning was also significantly improved. The results also showed that the training method is effective and efficient in responding to the training changes [24].

Many educational issues need to be addressed directly or virtually in the successful and effective education process. In addition, one should not neglect the impact of the cultural, social,

human and environmental conditions of a society on the process of teaching and learning. These elements involved in policy making and planning to improve the quality of education. Studying the literature related to the subject of the project led the researcher to divide the main factors affecting the blended education into five groups of structural, planning, informational, environmental, and supportive factors.

Identifying the factors affecting blended education requires proper and comprehensive implementation of this system to maximize its benefits. There are several factors that can be classified and summarized in the empirical and scientific resources available in this field:

A) Structural factors

Structural factors include issues related to policy making and management of various types of presentation. Policy factors often have a significant impact on the success of learning [25].

Management issues of the integrated learning process are related to issues such as infrastructure and supplies needed to manage different types of presentation. Delivering a blended learning program does more than just deliver the whole course in one way. It also covers issues such as registration and planning and planning different elements of the mix.

Managing learning types in blended learning requires a system of creating, storing, and maintaining all the resources and content of blended learning. Several key elements include the provision of content, technology, human resources, and the integration processes of learning types into an institution or educational organization.

B) Planning factors

This dimension involves need assessment, design and development of a blended learning leadership style. This dimension presents a scenario in which all learning objectives are listed in a specific program and selected in the most appropriate manner.

Content, audience, goal and media analysis, design approaches, instructional strategies, and organization and implementation strategies are considered in this dimension.

Issues such as bureaucracy, education, and student services are relevant to this type of learning. [26]. Blended Learning Includes Components: 1. Needs Assessment 2. Financial Readiness and Resources, 3. Infrastructure Readiness, Cultural Readiness, 4. Acceptance Registration and Payment 5. Implementation 6. Training Calendar . Marketing & Acquisition 8. IT Services.

Issues such as equal opportunities, cultural diversity, and nationality should be addressed when developing a blended learning program. Blended Learning programs should be developed so that all learners have the same learning experience for each component of the combined learning program. The program must be able to evaluate the effectiveness of each learner's learning program and performance. The type of presentation should use an appropriate evaluation method.

Blended learning assessment including learner evaluation (learner evaluation methods over the course), process evaluation, test templates, timetable, timing of test result feedback, access to test resources, use of resources during the test, environmental evaluation and evaluation tools and software required.

C) Environmental factors

Environmental factors contains issues such as socio-political influence, cultural diversity, prejudices and orientations. The digital divide, cultural diversity, socializing, familiarity with the legal issues should be taken into account in policy making and program management.

D) Informational factors

These factors fall within the context of issues related to technology infrastructure in the integrated learning environment. These include infrastructure planning, technology capabilities, digital literacy, hardware and software. The second part (design) refers to the overall view of a blended learning program, which is actually user interface design including learning materials and materials design, content design, access to resources and content delivery templates for learners.

E) Supporting factors

Resource support is related to providing different types of resources (offline, online, etc.) for learners and organizing them. Resource support can be counseling or training that is always available via email and chat. Supporting services for distance education students are different than others. [26]. In the resource support section, after this combination of open, flexible and distributed learning resources, online and in-person support, resources needed for meaningful learning environments are examined. Online support, face-to-face support, online resources, offline resources (self-tutoring) can be mentioned [27].

Based on Delphi results, the conceptual framework of the research was formed with five questions that were tested with confirmatory factor analysis.

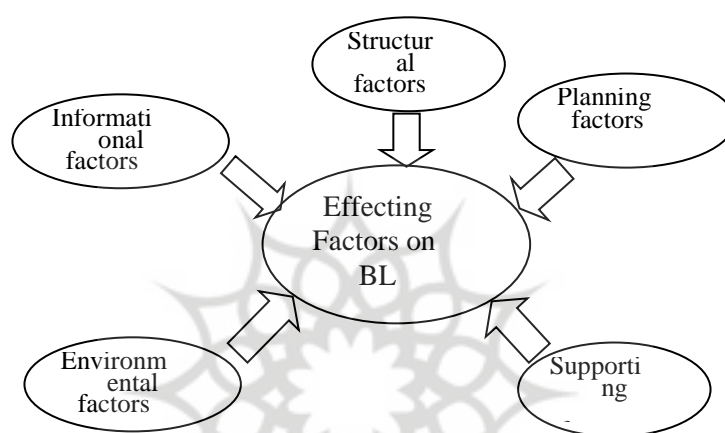


Figure 1. Conceptual model of research

Methodology

This study is an applied survey in terms of purpose. Data collection was done using survey methods. The research literature was studied for identifying the factors of development of blended education and Delphi method was used to find out the underlying variables of the factors affecting the development of blended learning in educational organizations. Using this method some invalid variables were excluded and the rest were grouped into relevant factors. These results were considered as inputs for subsequent analyzes.

A researcher-made questionnaire was designed using 40-item likert -type (five-item) based on delphi method data and in the other section a number of questions related to respondents' personal characteristics were designed. The statistical population of the study consisted of all faculty members of Tehran Payam -e-Noor University ,198 persons were selected using simple random sampling. Content validity of the questionnaire was used to assess the validity of the questionnaire by professors and experts. Cronbach's alpha formula obtained the reliability coefficient ($\alpha = 91\%$). A total of 200 questionnaires were distributed in the main stage, 12 of which were excluded from analysis due to incomplete analysis. The second part of inferential statistics and exploratory and confirmatory factor analysis method were used in LISREL ,SPSS software.

Research findings

The Kolmogorov-Smirnov test was used to calculate the normality of the variables. The results of this test are as follows:

Table 1. Calculation of Kolmogorov-Smirnov test

variables	M	No	SV
Structural factors	2.24	198	/.72
Planning Factors	1.25	198	/.87
Information Factors	1.49	204	/.94
Support Factors	1.76	204	/.12
Environmental factors	1.35	198	/.61

According to Table (1), the data can be assumed to be highly normal if the level of significance in the Kolmogorov-Smirnov test shown in this table is greater than 0.05. Otherwise, the distribution of data is not normal. Considering the above table and the significant level values for structural, planning, information, supportive, and environmental factors, it can be said that the distribution of variables can be normal with good probability.

The underlying factors were extracted through the analysis of principal components analysis and varimax rotation test. In this model, five factors were obtained with respect to the number of eigenvalues higher than one (Table 2).

Table 2. Eigenvalues of the factors derived from exploratory factor analysis without limiting the factors

Factors	Specific Value	Explanatory Power
1	8/008	20/02
2	5/99	14/98
3	2/36	5/92
4	1/82	4/54
5	1/52	3/80

The results of the Eigenvalues table (Table 2) show five factors. Among the five factors, the questionnaire questions can be well distinguished from each other so that the internal consistency of each sub-test was also obtained. The results of this analysis are as follows.

Table 3. Percentage of variance explained by the factors of compound education by each factor after the varimax rotation

Factors	EV	AEV	APV
Structural	5/17	12/94	12/94
The Planning	4/19	10/47	23/42
Information	2/91	7/27	30/69
Supporting	2/47	6/17	36/87
Environmental	2/03	5/08	41/96

As can be seen in Table (3), the percentage of total variance explained by 5 factors was 41.96%, the first factor (structural factors) with 5.17 Eigenvalues, 12.94%, the second factor (planning factors) with Eigenvalue 4.19, 23.42% and third factor (informational factors) with Eigenvalue 30.69, 91%, fourth factor (supporting factors) with EV 2.47, 36.87% and fifth factor (Environmental factors) (E = 0.03) explain 41.96% of the total variance of the test.

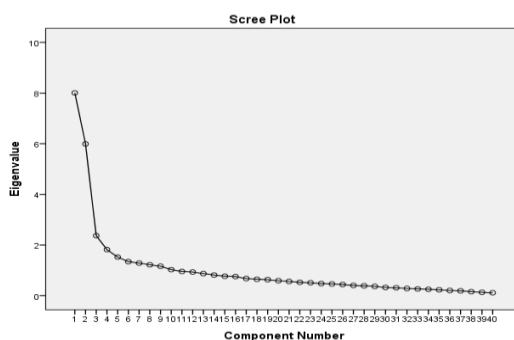


Chart 1. Justified variance

It can also be seen clearly in Chart (1) that the amount of justified variance (eigenvalue) decreases with the extraction of factors after the fifth factor.

Given the support of the proposed model and validation and reliability of the constructed instrument, the results of the test can be used to evaluate the development factors of blended learning. The mean and standard deviation of the components of the development of blended learning in the subscales of structural factors, structural factors, planning system factors, management information system factors, nature and work environment factors are presented in Table 4.

Table 4. Mean and standard deviation of the factors of blended learning development in the sub-components of identified factors

Factors	Mean	Standard Deviation	No. Q	No
Structural	37/51	6/46	12	198
Planning	29/90	5/39	10	198
Information	14/38	3/34	5	204
Supporting	17/41	3/49	5	204
Environmental	20/63	4/98	8	198

The results of Table 4 show that among the mentioned factors, the most important and influential factors in the development of compound education from the faculty members point of view are related to structural factors.

Results and Discussion

Today, blended learning is one of the new styles that in addition to facilitating the achievement of organizational and individual goals , also can help organizations to realize strategic plans. The aim of this study was to identify the factors affecting the development of the blended learning. By reviewing the literature, the effective variables were identified. Based on this, a conceptual model of factors influencing blended learning was developed. According to the

conceptual model presented in this study, the factors affecting the development of blended learning include structural, planning, informational, supporting and environmental factors. Each of these dimensions also included sub-components. Many of these components have been introduced in different research as an effective factors in the development of blended learning in educational organizations. Comparing the findings with previous researches mentioned in the literature, it can be concluded that the results are consistent with those of Kichenham [20], al-Badawi and Ali Jani [17].

Therefore, it can be concluded that the most important factors for the development of blended learning in educational organizations in terms of structural factors such as existence of decentralized structure, determination of staff duties and responsibilities, existence of laws and clear implementation guidelines for employee participation, diversity in workplaces activity, alignment between staff and organization goals, the interaction between management and staff, delegating authority to universities, preferring group interests over personal interests, experience of community and group life in the community, mutual trust between individuals. Organization, staff confidence in using their contributions, top management supporting to develop a new system of education, motivation for participation in administrative matters, the feeling of belonging to the organization's employees can influence it.

After structural factors, it is important and effective to have planning factors that determine the educational needs, the relevance of higher education to community issues, the transparency of regulations in higher education, the avoidance of immediate and cross-cutting decisions in higher education. Planning the necessary training for staff on how to participate and its benefits, faculty participation in performance evaluation can be effective in the effectiveness of the education system.

In the field of informational factors, staff have the necessary knowledge and expertise, staff access to adequate information, appropriate cultural backgrounds in higher education, political considerations, enhancing research in higher education.

Supporting issues such as social support networks, faculty and staff training manuals, staff familiarity with distance education systems, providing up-to-date learning resources in this area.

In terms of environmental factors, the suitability of the physical conditions of work, the feeling of safety at work, the professionalism of the work, the appropriate mental and psychological climate for participation, the freedom to provide work-related theories and suggestions, the independence of work, policies and the existence of job justice can have a significant impact. It is recommended that organizations use a blended learning approach in formulating their strategies so that they can apply the right and appropriate educational content in an optimal framework for individuals at the right time.

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