

# Blended Learning Environments: The Effectiveness in Developing Concepts and Thinking Skills

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## Abstract

This study aims to investigate the effectiveness of the philosophy of blended learning in the development of higher-order concepts and thinking of learners at the institutional, program, course and activity levels. We present this work as a result of difficulties in learning the concepts and developing thinking skills in the traditional education. The paper also outlines the components of the instructional curriculum design process in the blended learning environment.

**Keywords:** blended learning, e-learning, information and communication technology, schools of learning.

## 1. Introduction

In order to promote higher-order concepts and thinking, contemporary strategies of learning must be utilized to create challenging activities. These activities enable learner to gain meaningful knowledge and use their meta-cognitive abilities by linking new information to old. During the past decades there has been a significant movement towards blended learning and e-learning. Blended learning is important in developing concepts, thinking and emerges the most prominent delivery mechanism in higher education. Hence it is the instructional strategy, not just the technology that determines the quality of learning. So it is critical to define blended learning as well as explain it.

Blended learning can be traced as a learning platform where more than one type of learning is being applied with the use of optimizing the learning outcomes and the cost of learning (Rovai and Jordan, 2004). This way of teaching and learning unifies e-learning and traditional learning. Consequently, blended learning refers to the educational environment by which integrate and employ innovative technology with classroom learning in one framework, taking into account the dimensions that create better education. So that the e-learning tools such as software, computer facilities and the internet are merged with regular tutorials in which tutors meet with learners face to face more often. It is worth noting that it is unacceptable to ignore the prevailing educational techniques (Rhema and Miliszewska, 2010; So and Bonk, 2010).

Information technology can be used to increase the accumulation of information, concepts and skills associated with the studied subjects and to assist learners and tutors to cope with the nature of the new digital community (Persson, 2006). In addition, information technology may be used to work on the compatibility between various inflated and renewed information in different branches of cognitive life. Moreover, it gives learners the fun and excitement, and makes the learning more active. Its contributions effectively appear in teaching the subjects that may represent the difficulty of the learners.

There are many schools of thought on learning, none of them are used exclusively to design blended learning materials. As there is no single learning theory to follow, we can employ a combination of theories to develop the material of blended learning. These existing learning theories, however, were developed before distributed and networked learning was applied widely. In fact we do not need a new stand-alone theory for blended learning, but a model that incorporates the different theories to guide the design of blended learning materials.

## 2. Blended learning philosophy and components

The philosophy of blended learning is based on utilizing information technology applications in the design of new learning situations that combine both classroom and online teaching (Graff, 2003; Smith and Rademaker, 1999). In addition, blended learning philosophy is to simulate active learning, individual learning and learner-centered learning strategy.

Blended learning has a positive influence on the learning process as it is characterized with some advantages such as flexibility in both time and place of the study. It does not go with a fixed daily routine, but it overcomes the phenomenon of boredom experienced by learners. Moreover it increases the size of participation expertise, and diversifies sources of learning. This leads to better communication, affiliation and activation of social relationships between learners; taking into account their special abilities. Multiple entrances, roads, different tracks and several educational media are featured in blended learning. It provides opportunities for both self and cooperative learning hence integrates all of these with the active-learning which is based on the new technologies. Blended learning also gives a good opportunity to recognize the different cultures which directs the learner towards the research and survey, and provides feedback on time. This simulates the direct

communication with the tutors. In addition, it works to raise motivation which leads to create a state of satisfaction and acceptance for the learners. Therefore, the expected learning is obtained, the reduction of both the cost and learning time are achieved, and beneficial learning experiences at the proper time are attained.

In blended learning strategy many existing educational theories can be applied in different instructional situations. Some traditional learning experiences have good design depend on the theories and philosophies of blended learning (Chen and Jones, 2007; Fetch, 2006; Graham, 2005). Tutors can choose an individual theory for each appropriate position. Following the application of the learning theories of Bloom, Clark, Gagne, Keller and Miller, there are five basic and important elements of blended learning:

- *Teacher-led interactions*: It is a live and simultaneous interaction which is supervised by the tutors. It involves all learners at the same time, similar to what takes place in the classroom environment.
- *Self-step based interactions*: It is a learning experience by the learners themselves depending on times and learning capabilities. For example, e-learning and mobile learning are usually used in this part of learning.
- *Collaborative activities*: It is the environments in which the learners continue to learn in groups using, for example, emails, forum discussions and conversation rooms.
- *Pre-assessment*: It is a measurement of the learner's prior knowledge that can be done before entering the live self-stepping based interactions. Online assessments can also be performed to measure the progress of education.
- *Performance support materials*: The materials used as references to strengthen the learning progress. These materials demand reliable hardware and easy to use software, in addition to skillful, trained staff that supports the users and maintain the system.

For more information about blended learning philosophy and its constituents, the reader is referred to Kerres (2003), Matthew et al. (2010) and Morrow (2000).

### 3. Instructional design and content preparation in blended learning

To select the most appropriate instructional strategies, the blended learning developer must know the resolution of the following questions:

- What are the different approaches of learning?
- What are the key features of each approach?
- In which situations is an approach adopted?
- What blended techniques can be adopted to enhance learning?

Instructional design strategies should be chosen to

- motivate learners,
- build the whole person,
- promote meaningful learning,
- provide relevant feedback,
- cater the individual differences,
- facilitate deep processing and contextual learning, and
- provide support during the learning process.

According to the philosophy of blended learning there are a number of components of the instructional design process offered on the net:

- *Learners*: Learners are the target audience, hence the purpose of the website should take into consideration the needs of learners and their expectations about the information which they are studying and looking for.
- *Objectives*: When writing objectives, avoid terms that cannot be clearly understood by the learner. So, they have to be clear, drafted and taking procedural shapes.
- *Home page*: It should include the start of work such that its ramifications are content pages.
- *Content pages*: These pages include the table of study unit content or educational content target. It should be taken into account when designing pages the simplicity, clarity, consistency in color and using pastel colors in the background. Maintaining the length of the web pages has to be considered to make the loading relatively easy. Also we should take into account clarity of information in terms of the text and graphics, and readability on visual degree of differentiation between the size of the typeface, text blocks, addresses, and the surrounding white space.
- *Activities*: Learning tasks and activities that learners complete during their studies has to be determined using the website and usual classroom teaching. Also modules or educational objective target should be reviewed, and can be read and downloaded as power point presentations related to the library site. Learners are asked to use search engines e.g. Google which should be provided by the site to

accomplish learning tasks and activities in each module. Learners are asked to participate in learning activities concurrent (chat room, meeting classroom, segregation) and asynchronous (forum, search in library) in order to find solutions to the learning tasks, activities and the agreement between each group of students on the final solutions.

- *Course Contents*: The course should be devised in such a manner that the contents take the form of modules which makes the learning process easier. Each module must include module number, module address, behavioral objectives, previous tests, module configuration, module functions activities and online tests.
- *Group work*: An architectural plan for the lesson's learning has to be posted on the educational site. Learners are divided into small cooperating working groups ranging between five to six students. Group members collaborate to achieve the learning tasks. Each group has to identify coordinator which is responsible for either showing or delivering via, for example, email to the tutor the results achieved by group members.
- *Assessments*: Students try to solve the assessment questions whether they are in a test paper form or electronic test form. Manual assessment with pen and paper for large number of students causes difficulties for tutors. Introducing electronic assessment saves tutors time, reduces manual errors, and provides immediate feedback.

The term blended learning is used to describe a solution that combines several different delivery methods such as collaboration software, web-based courses and knowledge management practices. Blended learning is used also to describe learning that mixes various event-base activities, including face-to-face classrooms, live e-learning and self-paced learning. So, steps of content preparation in accordance with the concept of blended learning approach are going module by module, as follows:

- *Prevailing learning*: Blended learning starts with the prevailing classroom (face to face) by providing module primaries configuration. Then tutor discusses part of the multi module using one or more prevailing classroom teaching methods such as dialogue discussion, brainstorming, concept maps, problem solving and discovery of learning. This part of teaching module ends with the tutor alerts to the students that the quota will be completed next lesson in the virtual lab through the Internet.
- *E-learning*: Its goal is to complete the implementation of educational modules where students are conducted under the guidance of the tutor to e-learning virtual. Then each of the learning group uses one of the web techniques such as web quest, forum, chat room, questions bank, electronic library and related sites.
- *Classroom/video Conferences*: During this stage the tutor meets with students again in the classroom or holds a video conference to showcase the achievements and the tasks that the students have been assigned such as research, short reports, questions in the subject module. The tutor discusses and examines his students and then provides the feedback and chooses some of the work to be submitted online.

#### **4. Blended learning and development of concepts and thinking**

An important role of blended learning toward the learners is to develop the educational attainment and higher-order thinking skills. This can be achieved by choosing the best means and media for each tutorial goal either on the learning management systems or in the classrooms. Mixed teaching model is effective and this can be proven in developing the conceptual comprehension and motivation of learners. The study in (Ahn et al., 2013) shows that there is in fact correlation between the conceptual comprehension and the motivation to learn and find out. In addition, the proposed learning strategy has a great impact in the development of higher-order thinking among learners. Moreover, blended learning plays an important role in linking learning to work and affects the active participation of learners through their cooperation as well as the interaction with each other. Learners can exchange, analyze and discuss ideas to find solutions to the faced problems and to answer queries and questions asked by the tutor. Also learners might use e-learning tools available in the learning environment which has a great contribution to the development of higher-order thinking skills.

The difficulties of learning concepts and, in some cases, the concepts convergence or offset with the commitment of the tutor to follow the traditional teaching induce misunderstanding in some learners' concepts. Some studies (Ahn et al., 2013; Al-adwan and Smedley, 2012; Alkharang and Ghinea, 2013), revealed that the students' concept misunderstanding result from the multiplicity of sources that could happen due to the method of teaching, the tutor, the book and by the difficulty of the concepts. These studies also showed that the misunderstanding of some of the concepts is relatively high especially among opposite concepts with converged words. These studies recommended that learning developers should use modern strategies for the conceptual change to deepen the proper scientific understanding. Using technology is important in learning the concepts and acquiring the ability to self-learning. Moreover, the technology drives learners to further inquiry, analysis,

interpretation and criticism about the facts and concepts. It is possible to employ modular learning approaches (synchronous and asynchronous). Synchronous learning can be applied in direct discussions between tutors and learners in the classrooms or according provisions of the proposed teaching strategy of the lesson with the use of certain computer software developed in advance. The asynchronous learning is used in forums agreed with all students, emails and in the deferred activities.

Continuing on the above, subject contents should be organized in a way which conforms to the philosophy of blended learning. This philosophy includes the use of information technology and innovative trends in teaching to reduce the difficulty of concept learning. It is also recommended to organize the contents of the curriculum and introduce modern technological methods. It is to use computers in teaching as its effectiveness in reaching the objectives of learning has been proved especially the evolution of higher-order thinking skills. In addition, the Internet is longer active in learning concepts as an essential component of blended learning. There are many benefits of using the internet since learners do not feel bored and they can characterize the activities of online interaction, dialogue, feedback and models for the study units supported by online activities. Moreover, encourage the employment of information technology and innovative trends in blended learning changes the user trends (tutors and students) in the educational process. For instance, the availability of positive attitudes towards the role of computerized laboratories and computer simulation programs in learning are noticeable. The result of employment of modern technology such as virtual laboratories in teaching reflects the superiority in collecting knowledge of the concepts and helps to overcome learning difficulties.

To conclude this section, we can say that it is important to use blended learning in the development of concepts with interpretation using the multimedia which helps tutors to achieve the goals of learning. Moreover, tutors should emphasize and focus on the interpretations of learners and try to develop these interpretations to reach good scientific explanations with logical sequences of events and phenomena. The subjects including a variety of concepts do not require memorization but enable learners to stimulate their minds and break patterns of different thinking because of the applications of associated life with the nature of the subject content. This is identical to scientific studies; see for example Kerres (2003), which aimed to identify the features of the objectives of the curriculum for students. This is predominantly dealing with applications in the life and development of mental processes, problem solving, thinking development of scientific awareness and skill to members of the community based on the scientific debate and dialogue. These studies have also indicated that a group of scientific teaching methods that are commensurate with the nature of the proposed contents as the thinking subject contents requires an understanding and fitting of special concepts, laws and standards that have contributed to its formation.

## **5. Justifications and effectiveness of blended learning**

The main purpose of this paper is to investigate and analyze the factors that influence the adoption of blended learning in developing concepts and thinking in higher educational institutions. In Table 1 we summarize various justifications and effectiveness of blended learning philosophy in developing concepts and thinking skills.

## **6. Conclusion**

Blended learning is to combine multiple approaches to learning and can be accomplished through the use of blended virtual and physical resources. A typical example of this would be a combination of technology-based and face-to-face sessions used together to deliver the instruction. We collected the knowledge and options that influence developing concepts and thinking in blended learning environment regarding the author current practices. We also showed that blended learning environment provided in simplest strategies overcomes the difficulties of learning concepts and thinking.

We recommend activating the virtual learning labs in educational institutions and dedicating more attention to the relationship between the developments of concepts and thinking skills of learners. Tutors have to be prepared to employ information technology in the educational process in different ways. So, training of tutors on blended learning through inclusion in a professional development program has to be perfectly taken place. It has to be strived to activate communication between learners with each other and their tutors through the internet and work on the development of higher-order thinking skills of learners when learning so that the correction of misunderstanding patterns can be easily executed.

Table1: Justifications of blended learning in developing concepts and thinking

Developing Concepts	Developing Thinking
<p>Blended learning environment</p> <ul style="list-style-type: none"> <li>• Helps all learners to share in the total educational process.</li> <li>• Provides required time for the learning process.</li> <li>• Works to enrich the conceptual side of learning through electronic activities and classroom activities.</li> <li>• Enables learners to contact through the Internet to reduce learners' special abilities differences.</li> <li>• Increases the availability of e-learning experiences as well as self-learning abilities.</li> <li>• Activates the students' ability to search and survey.</li> <li>• Provides the tutors' feedback to the learners at suitable times.</li> <li>• Spreads intentionally the spirit of competition and participation to overcome the boredom.</li> <li>• Permits direct communications without fixed system using a flexible schedule.</li> <li>• Encourages cooperation among students through emails, chat rooms and specialized learning forums.</li> <li>• Deepens the concepts associated with the academic content by using either printed or electronic references, and teaching activities.</li> <li>• Motivates the exchange of ideas and cooperation in order to resolve the problems which clearly appear during group activities.</li> <li>• Authorizes tutors participation to provide explanations to some complex concepts in academic content.</li> </ul>	<p>Blended learning environment</p> <ul style="list-style-type: none"> <li>• Deepens the concepts and enriches the mysterious aspects of academic contents in order to avoid memorization.</li> <li>• Makes learners depend on understanding and using mental processes when performing tasks and activities.</li> <li>• Allows evaluation methods to measure higher levels thinking among learners through situations based on real life topics and scientific concepts.</li> <li>• Provides different types of internet navigation and activates learners' thought to obtain information.</li> <li>• Creates learning situations and encourages the learner to deepen in the course content.</li> <li>• Cures the learners' deficiencies in knowledge related to academic content.</li> <li>• Provides learners' self-confidence and ability to correct mistakes and resolve problems.</li> <li>• Increases the learner's ability to examine the relationship between concepts and classify them.</li> <li>• Works on developing the learners' ability to discover relationships between the faced issues and problems leading to develop information interpreting skills.</li> <li>• Develops the learner's ability to predict by offering examples and applications related to the course content concepts.</li> </ul>

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