

The Blended Learning Model: Does It Work?

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Abstract

The advances in information and communication technologies have led to the development of wide spectrum of new techniques, methods and models of education. One of these promising approaches in education is blended learning. Although the blended learning model is not new, it produces new kinds of learning experiences and encompasses a much richer set of learning strategies or “dimensions.” It maximizes the benefits of traditional and electronic delivery platforms, while diminishing the weaknesses of each. The aim of the present paper is to provide practitioners and researchers with a comprehensive framework outlining its basic characteristics and the rationale for adopting it. It also presents a multi-stage process model of it to identify the activities, actors, and key success factors associated with how best to set it up. It also outlines framework for how to evaluate the different interventions aiming at developing it.

Introduction

The main goal of educational activities is to make individuals creative, productive, with problem solving skills, and able to produce new products as they learn. Innovations in the Internet and information technologies offer individuals the opportunity to access information, to present and disseminate them cheaply and easily (Kayalar, 2020). These advances in information and communication technologies have led to the development of wide spectrum including new techniques, methods and models of education. One of the promising approaches with reference to the implementation of the digital technologies in

education is blended learning (Titov, Kurilov, Titova & Brikoshina, 2019).

Although the blended learning model is not new, it produces new kinds of learning experiences as it continues to evolve and mature. Blended learning can be defined as combining face to face education and internet/mobile. However, blended learning includes not only digitally mediated methods, offline or online, but also new non-computer educational tools and techniques (Kayalar, 2020). However, the term has evolved to encompass a much richer set of learning strategies or “dimensions”. Today a blended learning program

may combine one or more of the following dimensions, although many of these have overlapping attributes (Kayalar, 2020; Marunić, 2015; Singh, 2003).

- Mixing or combining different forms of web-based technology for an educational purpose such as virtual classrooms, self-education, learning together, video, audio or text.
- Combining different educational approaches such as a structuralist, behavioral, and cognitive approach to provide the best learning outcomes, with or without educational technology.
- Combining different educational technologies such as videotape, CD-ROM, web-based education and films with face to face instructor-guided applications.
- Mixing or combining educational technology with current tasks to create a harmonious effect between learning and study.
- Blending Offline and Online Learning.
- Blending Self-Paced and Live, Collaborative Learning.
- Blending Structured and Unstructured Learning
- Blending Custom Content with Off-the-Shelf Content.
- Blending Learning, Practice and Performance Support.

Blending learning can maximize the benefits of both delivery platforms, while diminishing the weaknesses of each. It retains the potential for the

immediate feedback that learners value while enabling greater participation on the part of learners who require more flexible schedules. Moreover, it enhances faculty's ability to be innovative, utilizing interactive learning activities and assignments and facilitating discussion on a variety of themes using resources from multiple partner centers and national resources. It offers increased opportunities for learners to reflect upon course concepts and share knowledge on a communal level (Lotrecchiano, McDonald, Lyons, Long & Zajicek-Farber, 2013).

Kachmarchyk, Khrystiuk and Shanaieva-Tsymbal (2019) and Titov, *et al.* (2019) distinguish the following benefits:

- Accessibility, flexibility, convenience, effective use of time.
- increasing the educational efficiency and students' personal motivation, autonomy, social activity;
- The possibility to vary the learning componential elements.
- Combining different training activities, the use of two or more different teaching methods, interactivity.
- Use of various techniques and approaches.
- Applying the teachers' control and students' self-control concepts.
- Efficient feedback.
- Improving the teacher – student communication and interaction quality.

- Students’ self-organizing in terms of planning their own educational activities, aimed at the outcome, identifying their own educational abilities, needs, interests, individualization of the learning process.

Alammary (2019) identified five different blended learning components which are:

- Face-to-face instructor-led.
- Face-to-face collaboration
- Online instructor-led
- Online collaboration
- Online self-paced educational approach

The development of blended learning may occur at different four organizational levels: activity level, course level, program level, and institutional level.

Blended learning is defined as a big concept that comprises four models of blended learning (Figure 1). Rotation Model and Flex Model are accomplished predominately on brick-and mortar location, while A La Carte Model and Enriched Virtual Model represent entirely online learning. Starting from four models, the first one Rotation Model is subdivided into additional four models: Station Rotation, Lab Rotation, Flipped Classroom, and Individual Rotation (Marunić, 2015).

The detailed comparison of each of these four major models in the blended learning classroom is discussed in Table 1 below (Ayob, Abd Halim, Zulkifli, Zaid&Mokhtar, 2020).

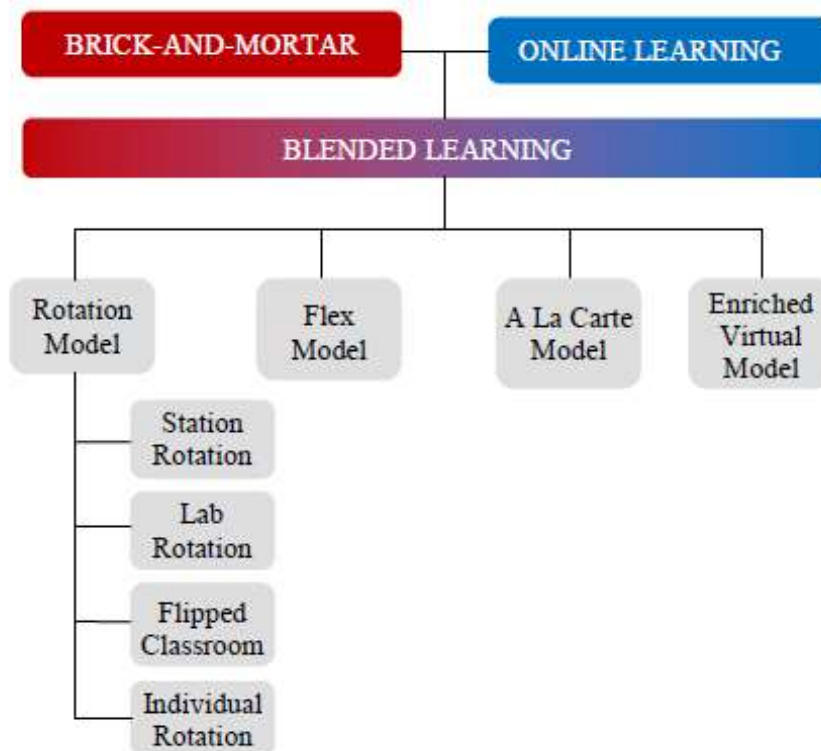


Figure (1) Models of the blended learning, adopted from Marunić, 2015, p. 62.

Table (1) Four Major Types of Models in Blended Learning Classroom, adopted from Ayob, et al. 2020, p. 322

Characteristics	Rotation model	Flex model	Self-blend model	Enriched-virtual Model
Setting	Within a classroom or a set of classrooms [12], [23], [25].	Learning online individually and learning at schools with a F2F teacher. Students learn mostly at school with a teacher using offline traditional F2F learning except for the homework [25].	Different from the enriched-virtual model because it is not a whole-school experience [23].	Whole school experience [23].
Rotation	Students rotate in a fixed schedule or according to the teachers' desires [12], [23], [25].	The content and instruction are fully delivered via online learning Backbone of this model is online learning [25].	Students can choose fully online methods to support their offline traditional F2F learning [23].	Students divide their time between offline traditional F2F learning and content delivery via remote online learning [23].
Learning method	Students rotate among stations. At least one station is an online learning station [23].	Students rotate individually among learning activities and offline traditional F2F teachers [23].	Students can take online learning at school or home [23].	It usually starts with a fully online learning method, then becomes a blended learning method [23].
Activities	The stations include direct instruction from the teacher, small group or whole class activities, group projects, individual tutoring and assignments [23], [25]. When the time is up, the teacher makes an announcement and instructs the students to rotate and go to the next activity at the next station [25].	Offline traditional F2F teacher will provide activities if needed - small group, group projects and individual tutoring [23]. Some have F2F teachers with the support of online learning, while some have only a little offline traditional F2F learning. They have different combinations too [23].	Students use online learning for some subjects and use offline traditional F2F learning for other subjects [25].	Students seldom meet F2F with their teachers every school day. It only happens when needed [25].
Station	Rotations have been used in many years, but what makes this blended learning is the involvement of online learning [12].	Some of them have more offline traditional F2F learning support, but others have minimum support for the traditional approach [23].	Students involve themselves in both online learning and offline traditional F2F learning [23].	Students will have F2F learning with their teacher and they are free to complete remaining works remotely [25].

Within the rotation model, there are four specific types which are station rotation, lab rotation, flipped classroom model and individual rotation model. Each specific type of rotation model is a little bit different from others; however, they are required to have at least one station which includes an online learning method. The table 2 below summarizes the four specific types of rotation

models in a blended learning classroom.

Transitioning from a traditional f2f program to a blended model with graduate-level coursework certainly produced challenges. Rasheed, Kamsinand Abdullah (2020) identified taxonomy of these challenges categorizing them into three main categories: students, teachers and institutions (Table 3, 4, 5).

Table (2) Four Specific Types of Rotation Model in a Blended Learning Classroom, adopted from Ayob, et al. 2020, p. 323

Characteristics	Station rotation model	Lab rotation model	Flipped classroom model	Individual rotation model
Setting/ Rotation	Students rotate in a fixed schedule according to the teachers' desires within a classroom or a set of classrooms [25][12]. [28]	Students rotate in a fixed schedule according to teachers' desires among locations in the school [28].	Students rotate in a fixed schedule between offline traditional F2F learning or projects in school and content delivery using online learning after school time independently [28]. Time in classes is used to discuss the concepts learned [12].	Students rotate in a fixed schedule among learning activities individually [28].
Learning method	At least one station is an online learning station [28].	At least one station is predominantly an online learning station in a computer lab [28]. Students rotate in computer lab for online learning [25].	The primary delivery of content and instruction from the teacher is delivered during online learning outside the school [25], [28]	At least one station is an online learning station [28]
Activities	Other stations: small group or whole class activities, projects in groups, individual tutoring, online individual learning, assignments, independent work at students' desks. direct instruction from a teacher [28]	Students rotate among different locations in the school instead of rotate in one classroom [28]	Students need to do homework online at night [25], [28].	Teachers will set student's schedules individually [25].
Setting	Students rotate in different stations in one classroom [25].	Very similar to station rotation; the lab will be free up for other activities within the rotation model [12].	Example: students use the internet to watch online videos for 10 15 minutes and complete questions on Moodle [28].	Example: students are given a specific schedule to rotate between online learning and offline traditional F2F learning [28].
Location	-	Teachers have been using lab rotation for many years, but the difference is that this model combines it with online learning [12].	Students practice and apply learning in school during offline traditional F2F learning [28]	-
Example	-	This model is common, but students need to compete with other students to use the computer lab [12]. There is also a limit of time to stay in a computer lab.	Example: students listen to teachers outside of the class time and complete the homework during class time with teachers [12].	-
Differences	Students rotate through all stations and not just the usual routines [25]. [28].	It was found out that the lab rotation model is ideal for teachers who want to use software to access the learning materials or to repeat and relearn a specific lesson [12]. Students rotate out of their classrooms to computer labs to further their understanding of the learning matter [28] More supervision and careful guidance are needed to prevent the students from misusing the computer labs [12].	Students will not be passive learners because it is more like an activity-based learning method [12]. Students can control their own time, place, path and pace [28] Allows the teacher to use class time efficiently to enhance the understanding of the topic [12].	Students do not need to rotate every available station or modality [25], [28]

Table (3) Students challenges in the online component of blended learning

Inductive categories (codes)	Sub-categories	Articles
Self-regulation Challenges (SRC)	Procrastination Online help-seeking challenge Lack of self-regulation skills Limited preparation before class Poor time management skills Improper utilization of online peer learning strategies	(AlJarrah et al., 2018), (Broadbent, 2017), (Maycock et al., 2018), (Chuang et al., 2018), (J. C. Y. Sun et al., 2017) (Broadbent, 2017), (Safford & Stinton, 2016), (G. Akçayır & Akçayır, 2018) (J. C. Y. Sun et al., 2017), (Lightner & Lightner-Laws, 2016), (Chuang et al., 2018), (Çakiroglu & Öztürk, 2017) (Long, Cummins, & Waugh, 2017), (Xiao, Thor, Zheng, Bæk, & Kim, 2018), (G. Akçayır & Akçayır, 2018) (Broadbent, 2017), (Zacharis, 2015) (Broadbent, 2017)
Technological Literacy and Competency Challenges (TLCC)	Challenge in handling different user interfaces Resistance to technology Technological distraction from overly complex technology Challenge of learning new technology by adult learners Lack of technological competency Students technological illiteracy Adult learners' intimidation by learning technologies Resistance to/or confusion about seeking appropriate online help Poor understanding of directions and expectations in 'online learning' of blended learning. Students perception of technology as a barriers to online help seeking	(P. Prasad, Maag, Redestowicz, & Hoe, 2018) (P. Prasad et al., 2018) (P. Prasad et al., 2018) (Salim et al., 2018), (Lightner & Lightner-Laws, 2016) (G. Akçayır & Akçayır, 2018) (Brown, 2016), (Kopcha, Orey, & Dustman, 2015), (Zacharis, 2015) Safford and Stinton (2016) Safford and Stinton (2016) Safford and Stinton (2016) (Kopcha et al., 2015)
Students Isolation Challenges (SIC)	Students alienation and isolation in online learning Students feeling of isolated and disinterested Students problem with synchronous online communication with the use of video projection, the microphones and speakers Remote students uncomfortable being center of attention	Chyr, Shen, Chiang, Lin, and Tsai (2017) Lightner and Lightner-Laws (2016) Szeto and Cheng (2016) (Bower, 2015)
Technological Sufficiency Challenges (TSC)	Insufficient access to technology Inequality of technological accessibility Outdated technology and lack of internet out of the class (in online component) Low bandwidth and slow processing speeds Experience of technical difficulties in completing assignments	Gopalan, Bracey, Klann, and Schmidt (2018) (G. Akçayır & Akçayır, 2018) Safford and Stinton (2016) Safford and Stinton (2016) (Henrie, Bodily, Manwaring, and Graham, 2015)
Technological Complexity Challenges (TCC)	Technological distraction from overly complex technologies Technological complexity Challenge with longer videos for learning	(P. Prasad et al., 2018) (P. Prasad et al., 2018) (Kim, Kim, Khera, and Getman, 2014)

Table (4) Teachers challenges in the online component of blended learning

Inductive categories (Codes)	Sub-categories	Articles
Teachers Technological Literacy and Competency Challenges (TTLCC)	Challenge in making students aware of the online materials that are available as part of their learning program	Cuesta Medina (2018)
	Challenge of training students in the use of online materials and effective approaches to autonomous learning	Cuesta Medina (2018) (G. Akçayır & Akçayır, 2018)
	Lack of technological competency	Maycock et al. (2018)
	Lack of experience with creating instruction content on LMS platforms	Boelens et al. (2017a)
	Challenge in fostering an affective online learning climate	Cheng and Chau (2016)
	Challenge in learning a new technology to manage online courses	Brown (2016)
	Technological Illiteracy	(Hung & Chou, 2015), (Bower, 2015)
	Resistance to technology	Lightner and Lightner-Laws (2016)
	Teachers lack of confidence, the time, and willingness to learn the use of technologies for teaching	(Brown, 2016)
	Technological anxiety	
Online Video Challenges (OVC)	Challenge in making quality online videos	(G. Akçayır & Akçayır, 2018)
	Spending too much time and effort in creating online teaching contents (videos)	Long et al. (2017)
	Time consuming and difficulty in creating and editing an online video content	Brown (2016) (Leo and Puzio, 2016)
Technological Operational Challenges (TOC)	Sharing of online videos is weighty with slow internet connections	
	Challenge in making students aware of online materials that are available as part of their learning program	Cuesta Medina (2018)
	Challenge of training students in the use of online materials and effective approaches to autonomous learning	Cuesta Medina (2018) Leo and Puzio (2016)
	Resolving technical difficulties is time consuming	Lightner and Lightner-Laws (2016)
	Time consuming in designing and managing online course	Bower (2015)
	Time wasting in troubleshooting technical problems	Bower (2015)
	Managing students in both modes (online-synchronous & online students) is challenging to teachers.	(Bower, 2015)
	Overly focused on remote students	
Teachers Belief Challenges (TBC)	Technology as a barrier to competency	Pilgrim et al. (2018)
	Flipped classroom regarded as one of the barriers between technology and teachers	Zengin (2017)
	Skepticism about the effectiveness of online activities in improving learning	(Lightner and Lightner-Laws, 2016)

Table (5) Educational institution challenges in the online component of blended learning

Inductive categories (Code)	Sub-categories	Articles
Technological Provision Challenges (TPC)	High cost of producing electronic content	Dehghanzadeh and Jafaraghaee (2018)
	Cost of online learning technologies	
	Overly complex technology - distractions to students	(G. Akçayır & Akçayır, 2018)
	Creation of tools that are flexible and compatible with other systems	(P. Prasad et al., 2018)
	Complexity of technology	Brown (2016)
Teachers Training Challenges (TTC)	Implementation of LMSs to suit students learning styles	(Brown, 2016) (Cheng and Chau, 2016)
	Challenge in training teachers in the use of online materials and effective approaches to autonomous use of online technologies for instruction	(Cuesta Medina, 2018)
	Other Challenges (OTC)	Lack of electronic technicians

Singh (2003) refers to Badrul Khan's Octagonal blended e-learning to enables one to select appropriate ingredients. This frame work serves as a guide to plan, develop, deliver, manage, and evaluate blended learning programs. The

framework has eight dimensions: institutional, pedagogical, technological, interface design, evaluation, management, resource support, and ethical (Figure 2).

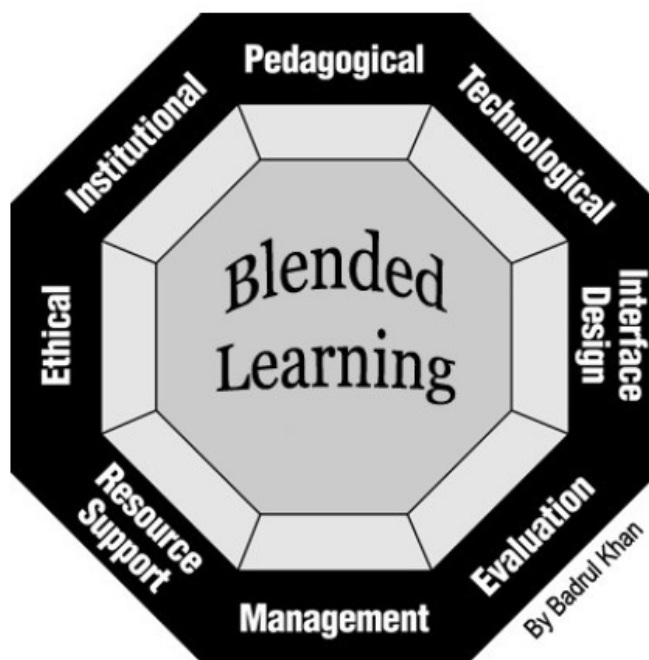


Figure (2) Khan's Octagonal Framework.

Each dimension in the framework represents a category of issues that need to be addressed. The Institutional dimension addresses issues concerning organizational, administrative, academic affairs, and student services. The Pedagogical dimension is concerned with the combination of content that has to be delivered (content analysis), the learner needs (audience analysis), and learning objectives (goal analysis). The technological dimension address issues such as creating a learning environment and the tools to deliver the learning program. The Interface Design dimension addresses factors

related to the user interface of each element in the blended learning program. The Evaluation dimension is concerned with the usability of a blended learning program. The Management dimension deals with issues related to the management of a blended learning program, such as infrastructure and logistics to manage multiple delivery types. The Resource Support dimension deals with making different types of resources (offline and online) available for learners as well as organizing them. Resource support could also be a counselor/tutor always available in person, via e-

mail, or on a chat system. The Ethical dimension identifies the ethical issues that need to be addressed when developing a blended learning program such as equal opportunity, cultural diversity, and nationality should be addressed.

Kayalar (2020) identified the various methods that may be useful to implement the following applications:

- Accessing tests and exams over the internet.
- Creating discussion boards online.
- Ensuring that source materials are available.
- Submitting preliminary work online.
- Providing instructor support to students.
- Using beneficial tools that help students organize information, review lesson instructions, and access summary information about the lessons requested.

- Creating virtual classes.
- Using e-mail and messaging effectively.
- E- Mailing students directly.

Concerning the evaluation of the blended learning, there are numerous frameworks and instruments for evaluating blended learning, although no particular one seems to be favored in the literature. This is partly due to the diversity of reasons for evaluating blended learning systems, as well as the many intended audiences and perspectives for these evaluations (Bowyer, 2017). However, it is important that any framework encompasses all aspects of the blended learning situation so that the interconnectedness is not lost. Bowyer (2017) proposed the following framework to achieve that.

Table (6) The framework for evaluating the blended learning

Level	Variable	Elements	Measurement
Situation	Context	Socio-economic Ethical Legal Cost Accessibility Cultural Geographical Support	Can be investigated by independent evaluation based on full knowledge of the programme's context, but more likely through interview with, or questionnaire for, course administrators and/or teachers.
	Institution	Support Administration	Can be measured through self-report questionnaires, interviews or focus groups with course administrators and/or teachers.
Course	Design and planning	Curriculum management Organisation of teaching (the 'blend') Flexibility Support	Can be investigated by independent evaluation based on full knowledge of the programme's context, using course materials, but more likely through interview with, or questionnaire for, course administrators and/or teachers.
	Content (online and in class)	Relevance and scope Quality Breadth of content Breadth of methods of presentation and activities Validity Accuracy and balance Interactivity Accessibility Organisation Currency (up-to-dateness) Support	Can be measured through independent evaluation of the blended learning platform and course materials (in relation to curriculum or specification documents) or self-report questionnaires (from students). Existing elements from the latter could be taken from: • HBLAM: Technical issues – information (content) quality • WEBLE: Information structure and design activities.

Continue table (6) The framework for evaluating the blended learning

Level	Variable	Elements	Measurement
	Assessment	Diversity Fit/relevance Support	Can be measured through independent evaluation of the blended learning platform and course materials (in relation to curriculum or specification documents) or self-report questionnaires (from students).
	Technology	Interface design Ease of use Security Reliability Usability Maintenance Accessibility Organisation Availability Personalisation Interactivity Currency (up-to-dateness) Support	Can be measured through independent evaluation of the platform or self-report questionnaires. Elements of the latter could be taken from: • HBLAM: Technical issues – system quality • WEBLE: Information structure and design activities • WEBLE: Quality • Online engagement scale (Krause & Coates, 2008) • The Technology Acceptance Model (Davis, 1993) can be used to explore the influence of technology.
Individual	Teachers	Attitude towards computers and technology Attitude towards learners Technological experience Teaching experience Subject knowledge Response time* Feedback* Support Provision of information	Can be measured through questionnaires, interviews and focus groups. Response time and feedback can be investigated using online platform data. There are few published instruments focussing on teacher perspectives. • Reed (2014): Learners' attitudes to technology in education.
	Learners	Attitude towards computers/technology Attitude towards learning Attitude towards teaching staff Motivation to take the course Study habits Technological experience Prior knowledge & learning experience Convenience Autonomy Perceived usefulness Perceived enjoyment Peer interaction/support* Group working and collaboration*	Can be measured through self-report questionnaires, interviews and focus groups. Existing elements could be taken from: • Peer-engagement scale (Krause & Coates, 2008) • Student-staff engagement scale (Krause & Coates, 2008) • WEBLE: Co-participatory activities • WEBLE: Emancipatory activities • HBLAM: Learner's perspectives • HBLAM: Instructor attitudes • Sun et al. (2008): learners' attitudes to technology.
Outcomes	Learner satisfaction	With course (overall) With learning With teaching Utility of course for future plans/education	Can be measured through self-report questionnaires. Existing elements could be taken from: • Sun et al. (2008): Perceived learner satisfaction • NSS: Contribution of course to knowledge, skills and development.
	Student engagement	Psychological and cognitive engagement Behavioural engagement Emotional engagement	Can be measured through self-report questionnaires. Behavioural engagement can be investigated using online platform data. Existing elements could be taken from: • Academic engagement scale (Krause & Coates, 2008): psychological/cognitive engagement • Intellectual engagement scale (Krause & Coates, 2008): psychological/cognitive engagement • NSS: Elements of behavioural and cognitive engagement.
	Course outcomes	Grades and marks Online activity Attendance Drop out rates	Can be measured using the online platform data and teacher reports.

*Note: These elements entail the communication, interaction and collaboration aspect of the framework.

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