

Critical Evaluation of Existing Theories and Models in Blended Learning in Higher Education

Mihiri Hapuarachchi (*mihirihapu@gmail.com*)
University of Sri Jayewardenepura, Sri Lanka

Abstract

In Sri Lanka there is a great demand for higher education that the government is finding difficult to fulfill. In addition, graduated students are lacking soft skills and industry needs even though they are very thorough with the theoretical knowledge. Higher education in various countries adopted various technologies to overcome such barriers. Blended learning is one such technology which is vastly used in developed countries in Higher Education.

This article reports on a literature review of blended learning models, frameworks, and theories. The study undertook a critical evaluation of blended learning and focused mainly of the design aspect of such models. Following a discussion of findings related to various blended learning models such as Blended Learning Assessment model, Hexagonal e-learning assessment model, time based blended learning model, 3-C model, hybrid online model, it has then outlined highly related theories to these models. Further as findings of this paper, most widely used subsystems of a blended learning programmes are given (example: learner, instructor, content, technology, learner support and institution). In addition, this paper further gives areas to be researched further, based on the dearth of research in some aspect of blended learning such as frameworks supported by education theories. Higher education systems are under permeant development. Although there are successful stories of higher education sector in Sri Lanka, perspectives of global solutions are still missing. Hence, this research intended to provide the researchers the foundation to carry out to find a suitable to blended learning approach to Sri Lanka. Also this study contributes to better understanding of blended learning, by summarizing different models, subsystems, and the research gaps in those models.

Keywords: Blended learning, Higher Education

INTRODUCTION

The higher education system in Sri Lanka has a great potential to become an important service sector taking advantage of the country's geographic position as well as the emerging trends in Asia and the region. To this end, the public component of higher education sector should be developed and improved while creating a capacity for well-regulated private sector to operate and provide increasing opportunity for domestic and other students to gain a high-quality education. Higher education faces the challenge of producing the high level human resources to improve and sustain Sri Lanka's human development (MOHE 2015). In this context; there had been increasing trend to use blended learning to improve quality of graduates (Young & Randall, 2014) in many other countries.

Even though in Sri Lankan Higher Education sector, it is visible that technology has been used and courses are being developed as distance learning programmes or e-learning programmes or on-line programmes, there is very much limited research conducted to see their effectiveness. Further there is lack of research on a suitable blended learning framework for Sri Lanka. It is hoped that this study subsequently can be used to help researchers to examine the existing blended learning models and theories to develop a suitable model to Sri Lanka.

Therefore, this study aims to provide highly cited models and theories in blended learning research through a review of recent literature on blended learning.

To achieve this aim, this article has first given a brief description on the definitions available for blended learning in the literature. Then it has evaluated the existing blended learning models and theories that has supported the development of such models. With this review of the recent literature on blended learning this has tried to identify the pros and cons of the existing models. This article has hoped to provide more comprehensive understanding of what sub-systems, are likely to be suitable for a blended model in the Sri Lankan context.

The article reports the finding of a study which has recorded the Blended learning models highly cited in the past decade.

Blended Learning

Blended learning has been defined in various ways in literature. Mostly Blended learning can be conceptualised as “the thoughtful fusion of face-to-face and on-line learning experiences” (Garrison & Vaughan, 2008).

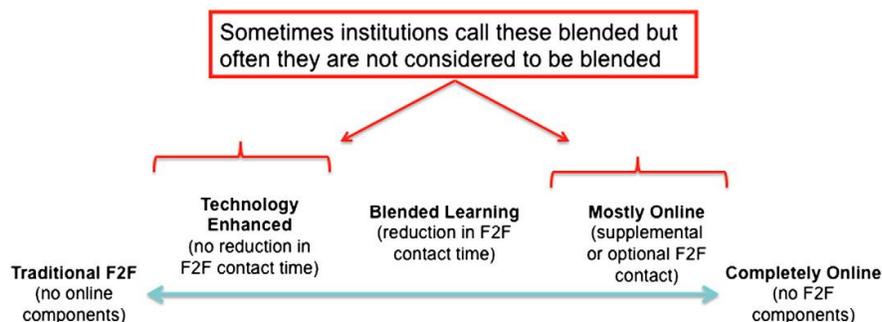


Figure 1. Spectrum of Blended Learning

However, blended learning is not clearly defined and sometimes the mere use of technology to course delivery, is taken as blended learning. See figure 1. (Graham, Woodfield & Harrison 2013). But to gain the real advantages of blended learning, it is essential to have a proper structure of the course and clearly defined face-to-face contact time and online learning time. This method should reduce the face-to-face contact hours of a normal face-to-face course. A fruitful quality discussion in a physical classroom is required when distance learning course is transformed to a blended learning course.

Three common objectives of blended learning are: widening access to educational opportunity, enhancing the quality of learning and reducing the cost of higher education (Garrison & Kanuka 2004). Blended learning has the capacity to overcome the limitations and drawbacks of the face to face learning (extensive lecture hours, overburden on resources, expensive, limited opportunities) and e-learning (less Motivation, lack of quality of programme) (Kerres & De Witt, 2003). 100% e-learning may not be the ideal solution for low income and underprepared students (Poon, 2012). Digital media will not substitute traditional approaches to teaching and learning (Kerres & De Witt, 2003). Studies give evidence that students prefer e-learning as

platform of downloading materials and submitting online assignments. But not as a platform for teaching and learning (Norbergs, 2011). E-learning is perceived as a self-study and students find difficult to absorb learning material and feel there is less focus and motivation on studies. Some studies show that e-learning is less preferred because the students like to communicate with “real people” (Garrison & Vaughan, 2008). Face to face teaching itself will not survive. Technology has lot of benefits (more flexibility, improvement of soft skills) that can support education (Kerres & Witt, 2003). Blended learning has taken the advantages of technology, with the existence of traditional approaches of teaching and learning.

Why Blended Learning

As explained in above, technology has been involved in almost every aspect of human being. Higher Education has no difference (Dias & Diniz, 2012). With the technology being engaged with the education, research has been conducted to showcase how best this can be utilized for the benefit of the students, institutes and education systems. In literature, it is argued that online learning is getting popular than face-to-face learning with students living in remote locations, but however blended learning is more popular because with the online learning it has not completely miss the face-to-face classroom setup (Pillay & James, 2014).

Research done as pilot studies on courses conducted as blended learning, show that there are positive attitudes of students towards blended learning (Safranji, 2013). This research also shows that students who do not have any experience on e-learning, found blended learning more approachable than 100% e-learning or distance learning courses.

Research shows that approximately 30% and 50% of distance education students fail to complete the course, and main reasons came out are difficulty of lesson, attitude, motivation, determination, success and satisfaction (Horzum, 2011). On the contrary research shows that blended learning is popular because it helps improve to learning environment (Kim, 2012), improve students’ team work skills (Ali, Joyes, & Ellison, 2014), improve knowledge through discussions outside the classroom (Young & Randall, 2014), improve human interaction compared other modes of e-learning and distance learning (So & Brush, 2008), and so forth.

Research on blended learning is getting increased because of its flexibility, satisfaction and effectiveness of students in higher education (Olapiriyakul & Scher, 2006).

Research Methodology

The aim of the research was to undertake a critical evaluation of the most cited blended learning models and theories. Models and theories shortlist from the research paper published on mostly cited research on blended learning in the past decade (Halverson et.al 2014). This would address the questions e-learning or face to face learning in higher education, thereby helping to gain credibility to blended learning.

The research was carried out through a literature review of the existing research on blended learning in higher education. Databases such as emerald and science direct, were used for this research in the period of September 2015 to June 2016. Key words such as ‘blended learning models’, ‘blended learning theories’, ‘blended learning in higher education’ were used.

During the data analysis the articles were reviewed under different categories. Categories were identified based on the intensions these theoretical frameworks were designed. Gibbons and Bunderson’s framework for categorizing types of research and theoretical inquiry (explore, explain, and design) were used to categorize these models (Halverson et.al, 2014). Since the length limitation of this article author has used literature that falls under the design category.

The overall intent of this paper is to provide a detailed picture of the existing models and theories on blended learning that researchers can draw on.

FINDINGS FROM THE REVIEW OF BLENDED LEARNING LITERATURE

As explained earlier this article as focused on the research done under ‘design category’ on models. In the research done by Halverson et.al, 2014, it has dictated four types of models that can be found in literature. Those are models that are designed as a framework to guide design, models as evaluation tool, models as a design process model, and models as an instructional model. One objective of this study is to identify components of a successful blended learning

model where it will help future research to build effective model suitable for Sri Lankan Higher education sector. In this context, for this article the models reviewed from the recent literature are categorized into two types. That is the models designed as a guideline for developing blended learning programme as one type and models developed as an evaluation tool is the other type.

In the research done by Halverson et.al, 2014, they have identified mostly cited publications in the past decade. For this research, author reviewed those articles and models fallen under above categories are evaluated based on the purpose of the model was designed.

A Framework to Guide the Design

3-C Model of Didactical Components: Kerres & De Witt (2003) illustrate on a didactical framework for design of Blended Learning. His framework known as the 3-C model. The 3-Cs are Content, Communication and Construction.

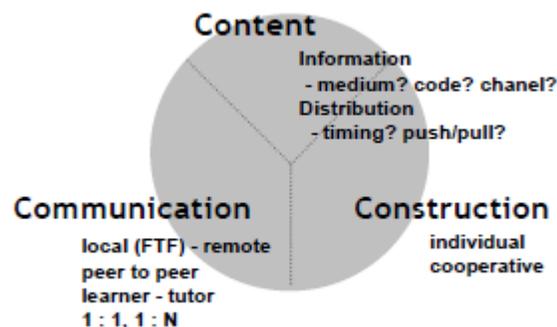


Figure 2. 3-C Model

Content discuss the availability of learning material and Communication focus on the interpersonal exchange between the lecturer and the leaner. The constructive component is where the learning tasks are managed and for each of these components, a delivery method to be identified. Therefore, this model gives a fair understanding of what to be looked into when designing a blended learning environment or a course. But still the author claims that all are not always necessary elements. Further the question lies with this model as well in other models is that to what extend each of these components to be electronic or face to face (Kerres & De Witt

2003). In conclusion author state that it is difficult to formulate a general guideline for a blended learning arrangements.

Khan's Octagonal Framework: In this model, it has identified eight (8) areas to be considered when building a blended learning programme. Those are pedagogical, Technological, Interface design, Evaluation, Management, Resource support, Ethical and Institutional(Ramakrisnana, et.al 2012).According to the literature many learning programs has used this model to as a guideline. However, the main drawback of the model is that the interlink between each element is not discussed or presented (Wang, et.al. 2015).

The Blended Learning Systems Structure (BLESS): In developing this tool, author argues that while technology has been used in education the link between educational principals are missing. Hence the tool is developed to bridge this gap by providing a framework to get web-based assistance from these educational principals (DerntlT & Motschnig-Pitrik 2005). The framework has 6 layers which are interlinking. Layer 0: Learning theory and didactic baseline; Layer 1: Blended learning courses; Layer 2: Course scenarios; Layer 3: Blended learning patterns; Layer 4: Web templates; Layer 5: Learning platform. The advantage of this tool, compared to some other models existing is that it is fundamentally based on the pedagogical principals of the Person-centered Approach. Hence it gives a foundation how to design a blended learning course without negative impact to the current acceptable pedagogical principals.

The Hybrid Online Model: The above model is developed by using the theory developed as seven principals of undergraduate education (Martyn, 2003). This author has developed a hybrid model by including the technology and face-to-face teaching without losing the basic principles of higher education. The important point highlighted in this model is to not to lose the human touch. First section of the course and last course of the section is face-to-face, thus there is a mechanism to ensure that all participants are gaining the learning outcomes of the course. According to the model learner is facilitated with the online learning with fellow students and faculty. This can model can be identified as the most basic model in the hybrid/blended learning. This does not discuss in depth of to what extend the faculty online learning and fellow students

online learning is required. Additionally, there is void area in this model as to how the faculty will identify which modules/areas to be categorized as online learning.

End User Training Framework: Ramakrisnan, et.al. (2012) describe above model as a guide to develop training courses. In this framework, ‘learning outcomes’ is an output of the ‘Learning and interaction process’. The learning process is effected by two variables i.e. individual differences and support given. The input for this process is the training methods, which again two types. Namely technology and learning techniques. However, this model is basically designed for training purposes. The great input for blended learning from this model is the variables used. This gives understanding of what are the factors that influence a learning process, and clearly technology plays a big role.

Urwin (2007) has also outlined six (6) principals to be considered when developing training programs with the use of ICT. Though all six are important principals (The need to shift from ‘education for ICT’ to the use of ‘ICT for education’; The need for ICTs to be integrated across the curriculum; The need to combine pre-service and in-service initiatives; The need for relevant, locally produced content; The need for real partnerships; The need to build sustainability into programmes from their inception), the most important fact to be considered in blended learning model is how ICT to be integrated across the curriculum.

Graham, Woodfield and Harrison (2013), identified three main areas in implementation of a blended learning framework, using the literature on Blended learning. In this, blended learning need to be planned and implemented in three board categories: Strategy, Structure and Support. Strategy is where an organization should define what is blended learning to them, create policies around them and so forth. With the structure it is mainly to have a model for blended learning, for administrative purposes. Support is the maintenance of the blended learning model.

Time-Based Blended Learning Model: In here authors named the model based on the synchronous/asynchronous nature of the course. Still it discusses same mixture of face to face learning and e-learning. It further emphasizes of 5 factors that required in success of model

(Norbergs, Dziuban & Moskal, 2011). Support (asynchronous work need to be supported more in order to keep the students engagement to studies), Migration (this is to use course discussions both asynchronously and synchronously, i.e a topic can be first discussed in a forum, and then summary of the findings can be a face to face lecture as a presentation), synchronous location (face to face, video chatting, and so forth), flow (synchronous and asynchronous learning should not miss the flow of the course and focus on the learning outcomes of the course) and learner empowerment (learners have the can use their abilities and resources more effectively).

Models Developed as an Evaluation Tools

Hexagonal E-Learning Assessment Model: This model was used to assess the successfulness of a blended learning system. Model consists of 6 dimensions of e-learning. Technical Issues: System Quality, Technical Issues: Service Quality, Technical Issues: Content Quality, Social Issues: Learner Perspective, Social Issues: Instructor Attitudes, and Supportive Issues. In the pilot study of this model, it shows that it is helpful to identify the applicability and the usefulness of each learning tool. Hence these dimensions can be used by any model to see the effectiveness of each learning tool, from different perspectives.

Blended Learning Assessment (BLA) Framework: As per Wong, Tatnall & Burgess (2014) to evaluate the effectiveness of a blended learning model, three areas to be considered.

“Readiness involves preparing the technical, commercial and social infrastructures necessary to support eBusiness; Intensity is the state or level of adoption and use of eBusiness, its volume, value and the nature of the transactions; and Impact is the added value that is potentially created”

Based on a case study evaluation, authors are suggesting that this framework is helpful to review the success of the blended learning model, as a whole.

Theoretical Contribution for Blended Learning

Even though there are many models, there only few models developed based on theories. Most commonly used theories are Garrison's Community of Inquiry, Moore's Transactional Distance

Theory, Wenger's Communities of Practice and Mezirow's Transformational Learning Theory (Drysdale, et.al, 2013).

In Garrison's Community of Inquiry (Wicks, 2015) there are three factors influencing the education experience of an e-learning model. Namely, social presence (to establish a community of learners by minimizing feelings of isolation, students may feel when learning online), cognitive presence (that is the extent to which learners can construct and confirm a meaning through sustained reflection and discourse) and Teaching Presence (that is course instructor is attentive to students' needs).

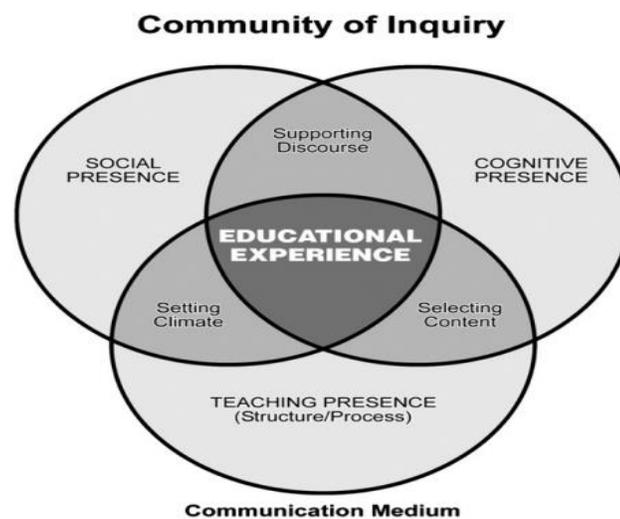


Figure 3. Community of Inquiry model

What is argued in Moore's Transactional distance theory is that if learning outcomes of any distance education course are to be maximized, transactional distance needs to be minimized or shortened (Horzum, 2011). In here 'Transactional distance is consisted of dialogue component which refers two way interactions between learner and teacher and structure component which refers to the extent to which an education program can accommodate or be responsive to each learner's individual needs'.

In the Communities of practice theory of Wenger, it is explained that where a group of people who share craft or a profession, they have an opportunity to develop themselves. In here

communities of practice are group of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly (Wenger 2011).

In the transformational learning theory of Mezirow's (Merriam, 2004), he believes that everyone has a particular view of the world derived from one's upbringing, life experience, culture or education.

Above theories help to understand the learner, instructor and the supporting subsystems in a learning environment. Hence models developed based on such theories have more credibility among the researchers (Drysdale, et.al 2013).

Implications and Summary

Purpose of this study was to better understand what are highly discussed subsystems in blended learning models that has worked effectively. Although there are many research done individually to see the effectiveness of blended learning courses and what subsystems they used, this study does not cover all those research. This study has reviewed models that have been highly cited, and also research backed with established theories.

According to the recent literature most widely used subsystems in model and frameworks related to blended learning are learner (95%), content (79%), technology (54%), teacher (32%), institution (17%), learning support (15%). These are based on the 87 articles that has been reviewed by Wang, Han, and Yang (2015) in their research.

It is noted that less attention is given for learning support and demographics to the blended learning (Halverson et.al 2014). Though in some research learner support and instructor/facilitator are taken as components (Taylor & Newton, 2013), there is dearth of instructor perspectives and the link between learner support and instructor. Further even though there are few explain types of models there is a significant gap in scientific research that describes real connections between blended learning and observed results (Graham et.al, 2014 & Halverson et.al 2014). Therefore, in developing a blended learning model for Sri Lanka, one has

to research more on the learner support required, based on learner attributes and instructor perspectives based, on their demographic features. There is a pressing need to investigate interactions and inter-dependence among sub-systems, as many models are not being tested as a one large system. (Wang, et.al. 2015). Yet in the same research after reviewing the research on blended learning research has drawn following positive conclusions. Blended learning is adaptive and hence response to changes within and in it. It is also dynamic. That is, though it has an inner structure, all the subsystems are transforming through their interaction with one another. Moreover blended learning has the ability to organize itself through the spontaneous emergence of new relationships and communication between and within each subsystem. Finally, it is co-evolving. In literature we can find that following a basic blended learning model, authors have developed small blended learning programmes for different subject or disciplines, such as nursing (Crawford et.al, 2013), property management (Poon, 2012), accounting (Dickfos & Cameron, 2012), English Language training (Safranjan, 2013), MBA programmes (Bentley, Selassie & Parkin, 2012).

The implementation of the courses required support from all partner institutions which needs to be covered strategic planning, financing, appropriate legal background and technical equipment (Pavla, et. al. 2015).

Implementation of a well-designed blended learning model can provide environments both students and teachers can perform different teaching and learning activities. This is far more extension that merely using technology such as Learn Management Systems (LMS) or other e-mails to share the course content (Kose, 2010).

For students, who are known to be engaged in a traditional class, now interact with the instructor, each other and outside world. Hence for many, blended learning has become simple using technology for a course delivery (Dziuban & Moskal 2011). However, research has been carried out on this new form of delivery known as blended, not only to create a rich and varied educational landscape to students but also to widen the access to higher education.

CONCLUDING STATEMENTS

The purpose of this article is draw attention to blended learning models which can be applicable to Sri Lanka. In the current higher education in Sri Lanka, commonly discussed issues are non-employability due to lack of skills, insufficient quality higher education institutes/universities to fill the demand and gap between the theoretical knowledge and practical knowledge of undergraduates.

Where blended learning has emerged as a flexible, convenient educational platform that can widen the access to educational opportunity, while reducing the educational cost without compromising the quality of the face-to-face teaching.

Yet, research has also proven that blended learning is itself cannot be rigid structure that anyone can follow. Mostly studies or models show that blended learning model needs to be developed based on its environment. Theories such as Mezirow's transformational learning theory shows, learners are different based on factors such as their up-bring, culture, former education. Hence when subsystems are identified, they should be thoroughly studies based on the educational theories.

Therefore, author suggest that future studies in relevance to developing a blended learning model to Sri Lanka, should focus on key subsystems such as learner, instructor, content, communication (face to face, remote, etc). In depth studies to be conducted to understand the characteristics of these subsystems such as perceptions, attitudes, and preference of students, and instructors. Then the focus to be drawn supporting subsystems such as learner support, technology. These should have supported by broader systems such as intuitional, goals and policies, organizational capacity, reliable infrastructure.

One other aspect to keep in mind when developing such models in Sri Lanka is the cost. The use of ICTs is most definitely not a cheap solution for teacher education (Unwin, 2005), but by facilitating the creation of new types of learning environment, by supporting distance-based

models of teacher training, and by opening up a wealth of new educational resources, it has a very significant role to play.

Finally, the other challenge is to find the optimal mix of online and face to face instruction (Martyn, 2003) that will leverage the major advantage of asynchronous learning (any time, any place), that will still maintaining the quality of faculty – student interaction. In early stages of blended learning it was an arbitrary mix of face-to-face and online learning (Moskal, Dziuban& Hartman, 2013). However, what is required now is an operational framework that would gain universal acceptance and prove a firm foundation for education policy making.

REFERENCES

- Ali, M.F., Joyes, G. & Ellison, L. (2014), “Building Effective Small-Group Team working Skill through Blended Learning at Malaysia Tertiary Institution”, *Procedia - Social and Behavioral Sciences*. Vol 112, No. 1, pp997-1009.
- Bentley, Y., Selassie, H. & Parkin, E. (2012), “Evaluation of a global blended learning MBA programme”, *The international Journal of Management Education*, Vol 10, No. 1, pp75-87.
- Christie, M., Carey, M., Robertson, A. & Grainger, P.. (2015), “Putting transformative learning theory into practice”, *Australian Journal of Adult Learning*, Vol 55, No.1, 9-30.
- Crawford,J., Brudnoy,L., Soong, T., & Graham, T. (2013), “Patient Navigation in Oncology Nursing: An Innovative Blended Learning Model”, *The Journal of Continuing Education in Nursing*. Vol 44, No. 10, pp461-561.
- Dias, S.B. & Diniz, J.A. (2012), “Blended learning in higher education: different needs, different profiles”, *Procedia - Computer Science*” Vol. 14, No. 1, pp 438-446.
- Dickfos, J. & Cameron, C. (2014), “Blended Learning: making an impact on assessment and self-reflection in accounting education”, *Education + Training*, Vol 56, No.2/3, pp190-207.
- Drysdale, J.S., Graham, C.R., Spring, K.J. & Halverson, L.R. (2013), “An analysis of research trends in dissertation and theses studying blended learning”, *Internet and Higher Education*, Vol.17, No.1, pp90-100.
- Dziuban, C. & Moskal, P. (2011), “A course is a course is a course: Factor invariance in student evaluation of online, blended and face-to-face learning environments”, *Internet and Higher Education*. Vol.14, No.1, pp 236–241.
- Garrison, R., and Vaughan, N., (2008), “Blended Learning in Higher Education Framework - Principles and Guidelines”, John Wiley, Chichester, Pg 5
- Garrison, D. R., & Kanuka, H. (2004), “Blended learning: Uncovering its transformative potential in higher education”, *Internet and Higher Education*, Vol. 7, pp. 95–105

Graham, C., Woodfield, W. & Harrison, J.B. (2013). "A framework for institutional adoption and implementation of blended learning in higher education". *Internet and Higher Education*. 18 (1), pp 4-14.

Halverson, L.R., Graham, C.R., Spring, K. J., Drysdale, J.S. & Henrie, C.R (2014), "A thematic analysis of the most highly cited scholarship in the first decade of blended learning research", *Internet and Higher Education*, Vol.20, pp 20-34.

Horzum, M.B. (2011), "Developing Transactional Distance Scale and Examining Transactional Distance Perception of Blended Learning Students in Terms of Different Variables", *Educational Sciences: Theory & Practice*. Vol.11 No. 3, pp.1582-1587.

Kerres, M., & De Witt, C. (2003). "A didactical framework for the design of blended learning arrangements", *Journal of Educational Media*, Vol.38, No. 2, pp.101–113.

Kim, J. (2012), "A study on learners' perceptual typology and relationships among the learner's types, characteristics, and academic achievement in a blended e-Education environment", *Computers & Education*, Vol. 59, No. 1, pp304–315.

Kose, U. (2010), 'A blended learning model supported with web 2.0 technologies', *Procedia social and behavioral sciences*, Vol 2, pp 2794-2802.

Martyn, M. (2003), "The Hybrid Online Model: Good Practice", *Educause Quarterly*, Vol 26, No.1, pp18-23.

Merriam, S.B. (2004), The role of cognitive development in Mezirow's transformational learning theory, *Adult education quarterly*. 55 (1), 60-68.

MOHE. (2015), "Vision and Mission", Available: <http://www.mohe.gov.lk/index.php/en/about-ministry/vision-and-mission>. Last accessed 10th Dec 2015.

Moskal, P., Dziuban, C.& Hartman, J. (2013), "Blended learning: A dangerous idea", *Internet and Higher Education*, Vol 18, No.1, pp15-23.

Norbergs, A., Dziuban, C., Moskal, P.D. (2011), "A time based blended learning model", *On the horizon*'. Vol.19, No. 3, pp207-216.

Olapiriyakul, K. & Scher, J.M. (2006). "A guide to establishing hybrid learning courses: Employing information technology to create a new learning experience, and a case study", *Internet and Higher Education*. Vol. 9, No 1, pp287–301.

Pavla, S., Hana, V. & Jan, V. (2015), "Blended Learning: Promising Strategic Alternative in Higher Education", *Procedia - Social and Behavioral Sciences*. Vol.171, No. 1, pp1245-1254.

Pillay, S. & James, R. (2014). "The pains and gains of blended learning - Social constructivist perspectives", *Education + Training*, Vol.56, No.4, pp. 254-270

Poon, J. (2012), 'Use of blended learning to enhance the student learning experience and engagement in property education', *Property Management*, Vol. 30, No. 2, pp.129-125

Ramakrisnan, P, Yahya, Y, Hasrol, M.N.H, Aziz, A.A (2012), "Blended Learning: A Suitable Framework For E-Learning In Higher Education", *Procedia - Social and Behavioral Sciences*, Vol. 67, pp. 513 – 526

Safranji, J. (2013), "Using Information Technology in English Language Learning Procedure: Blended Learning", *Procedia - Social and Behavioral Sciences*, Vol. 83, No. 1, pp. 514-521.

So, H. J. & Brush, T. A. (2008), "Student Perceptions of collaborative learning, social presence, and satisfaction in a blended learning environment: Relationships and critical factors", *Computers & Education*, Vol. 51, No. 1, pp.318-336.

Taylor, J.A. & Newton, D. (2013), "Beyond blended learning: A case study of institutional change at an Australian regional university", *Internet and Higher Education*, Vol. 18, No.1, pp. 54-60.

Unwin, T. (2005), "Towards a framework for the use of ICT in teacher training in Africa", *Open Learning*, Vol.20, No.2, pp113-129

Wang, Y., Han, X., & Yang, J. (2015), "Revisiting the Blended Learning Literature: Using a Complex Adaptive Systems Framework", *Educational Technology & Society*, Vol.18, No2, pp. 380-393.

Wenger, E. (2011). *Communities of Practice: Brief Introduction*. Available:
<https://scholarsbank.uoregon.edu/xmlui/bitstream/handle/1794/11736/A%20brief%20introduction%20to%20CoP.pdf?sequence=1&isAllowed=y>. Last accessed 29th Sep 2016.

Wicks, D.A., Craft, B.B, Masonc, G.N., Gritter, K. & Bolding, K. (2015), "An investigation into the community of inquiry of blended classrooms by a Faculty Learning Community", *Internet and Higher Education*. 25 (1), 53-62.

Wong,L., Tatnall, A. and Burgess S. (2014). "A framework for investigating blended learning effectiveness", *Education + Training*. Vol. 56, No. 2, pp. 233-251.

Young, N and Randall, J., (2014), "The Use of blended learning to create a module about ill health during childbirth for pre-registration midwifery students", *Nurse Education in practice*, Vol. 14, No. 1, pp. 87-91