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Preliminary Studies and Pilot Testing to Implement Blended Learning Approach in Learning 3D Drawing for Secondary School Students

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Abstract

This paper presents an insight on the preliminary studies and pilot testing conducted to implement blended learning approach in learning 3D drawing for secondary school students by blending face-to-face classroom with ICT-based settings using 3D Blender Tutorial Courseware, Youtube and Whatsapp interactive group chat apps. The objective is to evaluate the effectiveness of blended learning approach on the students' drawing skills, motivation, and learner autonomy, and also to determine the impact of students' perspective of blended learning and teachers' attitudes on their learning outcomes. The study was conducted by using quantitative method through performance evaluation and survey on 40 secondary school students from Malaysian Arts School, Johor and English College, Johor. It was found that there was a significant difference in the respondent's level of 3D drawing skills, motivation and learner autonomy after using the blended learning approach. This study also revealed that the *respondent*'s attitude towards *blended learning and perception of teacher's attitude had a strong and significant effect on their motivation and learner autonomy but no significant effect on their 3D drawing skills. The outcome of this study can be used to determine whether blended learning approach is effective in a technical art setting particularly in teaching and learning 3D drawing for secondary schools.*

Keywords: *Blended Learning, 3D drawing, 3D Blender, Malaysian secondary school, technical art course/subject*

Abstrak

Kertas kerja ini membentangkan kajian preliminari dan rintis yang dijalankan dalam perlaksanaan pendekatan pembelajaran teradun untuk pelajar-pelajar sekolah menengah dalam mempelajari lukisan 3D dengan menggabungkan kaedah bersemuka di kelas dan penggunaan ICT melalui penggunaan koswer tutorial, Youtube dan apps interaktif Whatsapp. Tujuan kajian adalah untuk mengkaji keberkesanan pendekatan pembelajaran teradun ke atas tahap kemahiran melukis 3D, motivasi dan autonomi dalam pembelajaran di kalangan pelajar, serta mengenalpasti sama ada perspektif pelajar terhadap pembelajaran teradun serta sikap guru boleh mempengaruhi hasil pembelajaran mereka. Kajian dijalankan secara kuantitatif menggunakan kaedah penilaian prestasi dan soalselidik bersama 40 orang pelajar dari Sekolah Seni Johor dan English College, Johor. Kajian menunjukkan perubahan ketara pada tahap kemahiran, motivasi dan autonomi dalam pembelajaran responden selepas perlaksanaan pembelajaran teradun. Kajian ini juga mendapati bahawa perspektif responden terhadap pembelajaran teradun dan sikap guru boleh mempengaruhi tahap motivasi dan autonomi dalam pembelajaran mereka tetapi tidak memberi kesan memberangsangkan terhadap tahap kemahiran melukis 3D mereka. Dapatan kajian ini boleh digunakan sebagai rujukan untuk memutuskan sama ada pendekatan pembelajaran teradun sesuai dilaksanakan dalam pengajaran dan pembelajaran yang berkonsepkan seni teknikal terutamanya dalam pengajaran dan pembelajaran lukisan 3D di sekolah menengah.

Kata kunci: *Pembelajaran teradun, lukisan 3D, 3D Blender, subjek seni teknikal, sekolah menengah Malaysia*

INTRODUCTION

In recent years, blended learning approach has been implemented in technical, vocational and arts education system such as in technical drawing, engineering drawing, animation, art and creative design subjects by combining face-to-face learning in classroom with computer assisted instructions or simulations to improve students' learning achievements. Numerous studies have shown that learning materials in technical subjects are delivered best in blended learning mode, easier to be planned and managed, able to enhance classroom interactions, able to be delivered to a large population of learners, allow learners to visualize the components and procedure, and allow learners to learn at their own pace and to repeat the process as many times as they require for complete understanding (S.M. Abdoolrasool, 2010). However, despite the fact that blended learning has been widely implemented in other countries, it is still at its infancy stage in Malaysia. In addition, research on the effectiveness of blended learning approach in a technical art course such as 3D drawing as well as the implementation of blended learning at secondary school level is still in vague and yet to be examined from the point of view of both teachers and students.

Hence, this study seeks to uncover the potentials of blended learning approach in a technical art setting of Malaysian education system using a combination of face-to-face settings and ICT-based settings such as a multimedia courseware developed by the researcher namely 3D Blender Tutorial Courseware, online video instructions - YouTube and interactive group chat apps - Whatsapp. The objective of this preliminary study is to evaluate the effectiveness of blended learning approach on secondary school students' drawing skills, motivation, and learner autonomy, as well as to determine whether students' perspectives of blended learning and teachers' attitudes play a significant role in affecting their learning outcomes in the blended learning approach. The outcome of the study can be used to determine whether blended learning can serve as a practical and effective pedagogical practice in technical art subjects/courses particularly in teaching and learning 3D drawing at secondary school level and consequently implemented in the education system so that it will revolutionize the conventional way of learning practices conducted in the present classroom setting.

LITERATURE REVIEW

Blended Learning

Blended learning can be defined as the convergence of face-to-face settings, which are characterized by synchronous and human interaction, with Information and Communication Technology (ICT) based settings, which are asynchronous, text-based, and involve humans operating independently (Graham, 2006). The definition was later extended by Mason and Rennie (2006) to include "other combinations of technologies, locations or pedagogical approaches" (p. 12). It carries on as Garrison and Vaughan (2008) define blended learning as "the thoughtful fusion of face-to-face and online learning experiences" (p. 5) and emphasize the need for reflection on traditional approaches and for redesigning learning and teaching in this new terrain. Dziuban et al. (2006) defines blended learning as a mix of pedagogical approaches that combines the effectiveness and the socialization opportunities of the classroom with the technological enhancements of online learning. In other words, blended learning course should increase the interaction between the instructor and learners, and also among learners. It should furthermore enhance the mechanism for integrating formative and summative feedback in order to boost learners' learning experiences (Yen & Lee, 2011).

A main feature of blended learning is that the learning environment is designed to accommodate the fact that learners have different learning needs and preferences. This pedagogical model encourages learners to learn in an interactive and collaborative environment, and at their own pace and in their own time (Graham, 2006). Therefore, blended learning is a fundamental redesign

of the instructional model with a shift from lecture-centered to learner-centered instruction where learners become active and interactive learners.

3D Drawing

3D drawing refers to the drawing of three-dimensional objects that are rendered visually on paper, film or on screen in three planes representing width, height and depth (X, Y and Z). It can be drawn by using 3D modeling software to produce 3D models such as animated films, visual effects, art, 3D printed models, interactive 3D applications and video games. In this study, 3D Blender program which is developed by software developer Ton Roosendaal was used as the program is much easier to handle and understand and also cheaper (free and open-source).

There are many ways to implement blended learning approach in learning process. In this study, rotation blended learning model as proposed by Horn and Staker (2011) was used where the learning process was rotated on a predetermined learning schedule between conventional face-to-face classroom setting and online learning in a self-paced environment.

Impact of Blended Learning

Several research studies have demonstrated that courses using blended learning as a delivery method contribute to improve learner's learning outcomes (Boyle et al., 2003; Dziuban et al., 2006; Garnham & Kaleta, 2002; Lim & Morris, 2009; O'Toole & Absalom, 2003; Twigg, 2003a), reduce learner's drop–failure–withdrawal (DFW) rates (Twigg, 2003a; Garrison & Kanuka, 2004), improve learner's grade, knowledge acquisition and construction, increase learner's satisfaction (Twigg, 2003a; Kenney & Newcombe, 2011; López-Pérez et al., 2011; Garrison & Kanuka, 2004; Rahman et al., 2011), increase value added learning, enhance learner's participation, increase enjoyment of learning, increase learner's ability to facilitate group work in an efficient manner (Banks, 2001), prepare learners for the technological advances (Barshay, 2011), enhance learner's commitment and perseverance (Donnelly, 2010; Sharpe et al., 2006; Wang et al., 2009; Woltering et al., 2009), develop critical thinking skills (Naemah Abdul Wahab et al., 2016), reinforce learner's autonomy, reflection, and powers of research (Chambers, 1999; Lebow, 1993; Radford, 1997; Sharpe et al., 2006; Tam, 2000; Naemah Abdul Wahab et al., 2016). For learning institutions, blended learning can also be effective in cost saving (Graham, 2006; Twigg, 2003b; Vaughan, 2007) and fostering a professional learning community (Owston et al., 2008).

Issues and Challenges of Blended Learning

Among the issues and challenges of blended learning implementation are: low technological competency for learners; lack of IT facilities and appropriate tools/equipment; poor quality, ease of use & reliability of design features, system functionality and learning materials; negative perceptions/attitudes on technological applications; time commitment due to workload and family responsibilities; poor self-regulation skill; lack of support from family and peers; and lack of interaction or face-to-face support by educators/instructors (Hofmann, 2014; Ginns & Ellis, 2007; Kintu et al., 2017; Park & Choi, 2009; Cohen et al., 2012; Pituch & Lee, 2006).

Therefore, consideration of learners' needs and management of their expectations and level of understanding is important for the development and implementation of successful blended learning modules (Bliuc et al., 2007; Harris et al., 2009; Mitchell & Honore, 2007). Evidence from the literature also suggests that it is important to take account of learners' motivation (Stewart, 2002) to ensure readiness (Baldwin-Evans, 2006) and ability to cope with independent learning (Tabor, 2007). Mitchell and Honore (2007) see the attitude and motivation of learners as particularly significant when virtual learning (e-learning) is involved, as those factors affect acceptance and participation. Furthermore, blended learning can only be successfully implemented if the learners have sufficient knowledge of, and are ready to use, the newly introduced technology. Hence,

learners must be adequately trained and equipped to navigate the information and communication technology used in blended learning (Beadle & Santy, 2008; Harris et al., 2009).

Other than that, the attitude, readiness, and technological skills of the blended learning instructors are also equally important (Beadle & Santy, 2008; Harris et al., 2009). Necessary policy, planning, resources, scheduling, and support systems must be provided by learning institutions to ensure that blended learning initiatives are successful.

Blended Learning in Malaysia

Even though blended learning offerings are popularizing and gaining momentum, the adoption rate in learning institutions in Malaysia is still low despite its effectiveness as a learning approach. A study by Haryani et al. (2012) identified that only 13 percent of the Malaysian academicians adopted this learning approach. This is due to lack of readiness for the new technology and poor quality of Internet connectivity. Katrina Bushko (2017) added that there are four challenges that the majority of Malaysian school educators are facing: reliable and sufficient internet (77.31%), infrastructure problems (65.55%), high-quality professional development for teachers (55.46%), and funding and/or finance (55.46%).

Past studies have also shown that blended learning approach in Malaysia has been implemented mostly in higher learning institutions but not so much in public schools. Hence, this study was conducted to assess the effectiveness of blended learning approach at secondary school level.

METHODOLOGY

Conceptual Framework

By referring to Hexagonal E-Learning Assessment Model (HELAM) (Ozkan, 2009), this study would be focusing on five variables to be examined which are: skills, motivation, learner autonomy, students' perspectives and teachers' attitudes. The conceptual framework developed in this study is presented in Figure 1.

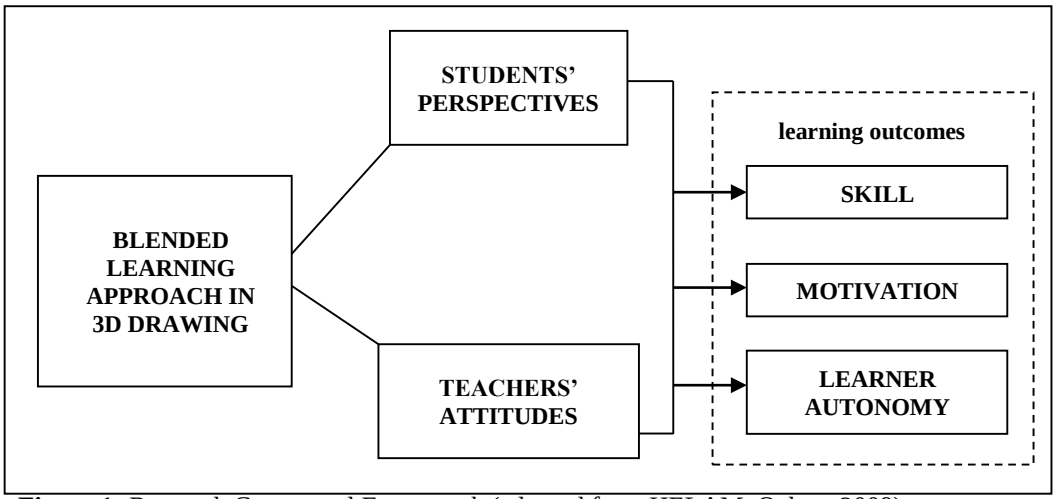

Figure 1: Research Conceptual Framework (adopted from HELAM, Ozkan, 2009)

Hypothesis

Five hypotheses were developed in this study.

- H_1 - There is a significant difference in the level of 3D drawing skills of students before and after using blended learning approach.
- H_2 - Blended learning has a significant and positive effect on the student's motivation in learning 3D drawing.
- H_3 - Blended learning has a significant and positive effect on the student's learner autonomy in learning 3D drawing.
- H_4 – Students' perspective of blended learning has a significant effect on their learning outcomes.
- H_5 – Students' perspective of teachers' attitudes has a significant effect on their learning outcomes.

Instructional Design for Blended Learning

The instructional design of the 3D drawing blended learning module developed by the researcher using the ADDIE model is presented in Figure 2.

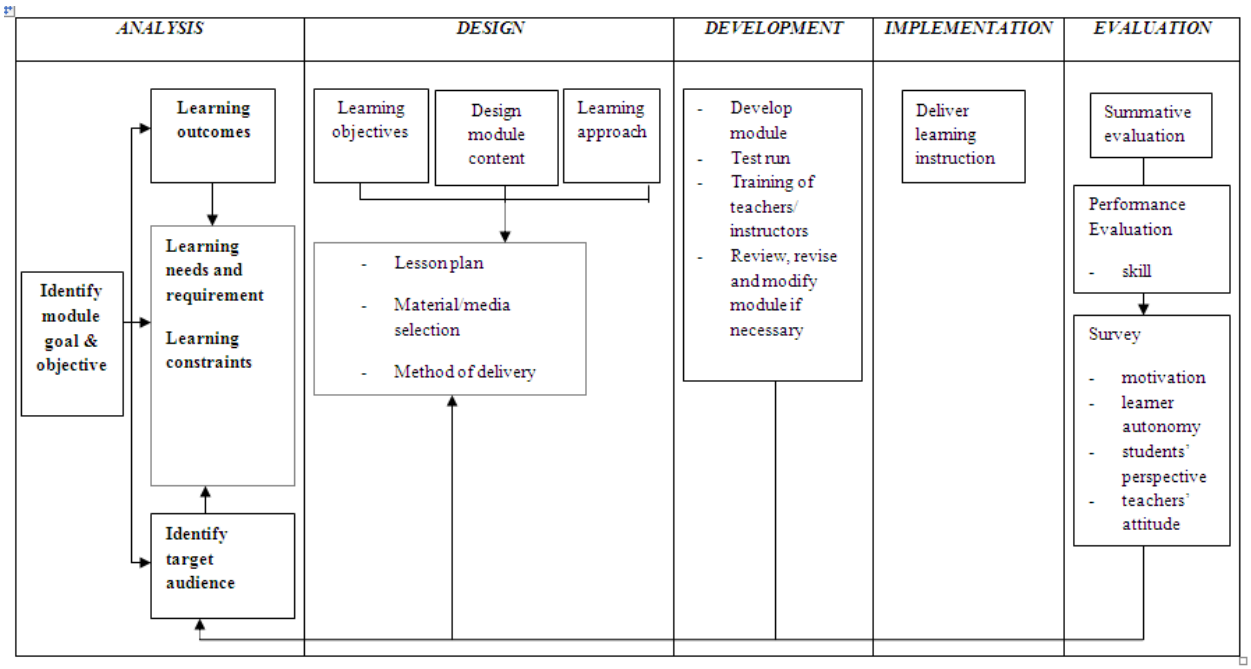

Figure 2: Instructional design of the 3D drawing blended learning module using the ADDIE model

In this study, the 3D drawing learning module was designed using the integration of these learning approaches:

- 2x 2 hours session of face-to-face in classroom using multimedia courseware 3D Blender Tutorial as the learning material
- 5 weeks of self-directed and independent e-learning using multimedia courseware 3D Blender Tutorial as the learning material
- video online instruction YouTube for additional reference

- interactive chat group application (Whatsapp) for discussion, online interaction and teachers' feedback

Research Design

The study was completed using quantitative analytical approach by conducting performance evaluation and survey on 40 respondents before and after blended learning approach is implemented. The purpose of the performance evaluation is to verify if there is any improvement of the respondents' level of 3D drawing skills using the 3D Blender program after the implementation of blended learning approach. Meanwhile, the purpose of the survey is to gain their perceptions on the level of their motivation in learning 3D drawing, their learner autonomy, their perspectives on blended learning and teachers' attitude in the blended learning implementation. The sample was purposively selected from Sekolah Seni Malaysia (Malaysian Arts School), Johor Bahru and English College, Johor Bahru as they fulfill the criteria as secondary school students who were undertaking arts and design courses which require them to have good 3D drawing skills, and possess good computer literacy and interest in learning 3D drawing.

In the performance evaluation research procedure, the instrument used was 3D Drawing Skill Evaluation Form where the respondents' level of 3D drawing skills was evaluated in terms of their knowledge on the 3D Blender program, 3D drawing accuracy, visualization skills and time taken to create 3D drawing. The difference between total scores before and after the implementation of blended learning approach was calculated to verify if there is any improvement of the respondents' level of 3D drawing skills using the 3D Blender program.

In the survey procedure, the instrument used was a set of questionnaires which was structured and organized to serve as the primary source of information on the respondents' motivation in learning 3D drawing, learner autonomy, perceptions towards technology and blended learning, and towards teachers' attitudes before (Pre) and after (Post) the implementation of blended learning approach.

A pilot test was conducted with 5 respondents to ensure the clarity of the question statements and to detect any weakness of the questionnaire so that modification on the questions could be done before the actual research was carried out. Once the pilot-testing was completed and the required modification was done, the survey forms were distributed to the respondents where they were required to complete the form according to their level of agreement based on a five-point Likert scale where 1 represented "strongly disagree" and 5 represented "strongly agree".

The data collected was processed using the statistical package for social science (SPSS) where the variables of interest to the researcher are skills', 'motivation', 'learner autonomy', 'students' perspective' and 'teachers attitudes'. First, Descriptive Analysis was carried out to evaluate the difference in performance of the respondents' 3D drawing skills before and after the implementation of blended learning approach; respondents' perceptions on their motivation; and respondents' perceptions on their learner autonomy. Next, Correlation Analysis was conducted to see the relationship between students' perspectives of blended learning, teachers' attitudes and learning outcomes to test the hypotheses H_4 and H_5 for the study. Finally, the survey data was analyzed using Regression Analysis to check the significance of each variable with learning outcomes.

Data Analysis

The Descriptive Analysis conducted revealed that majority of the respondents had improved their level of knowledge in 3D drawing, 3D drawing accuracy, visualization skill and completion time in creating 3D drawing using the 3D Blender Program after using the blended learning approach. It was also found that there is a difference in the level of motivation and learner autonomy of the

respondents before and after using the blended learning approach. Based on these findings, hypotheses H_1, H_2 and H_3 were supported.

The analysis also revealed that majority of the respondents had positive perception of technology and blended learning approach, especially those from English College (mean=4.63) compared to Sekolah Seni respondents' (mean=4.11). This is due to the fact that they are more exposed to various technology tools like smartphones, tablets, multimedia software and Internet. Other than that, the findings in this chapter indicate that majority of the respondents had positive perceptions towards teacher's attitude throughout the blended learning process.

A summary of the Correlation Analysis results for 'perspective of blended learning' and 'perspective of teacher's attitude' variables with other dependant variables is shown in Table 1 below.

Table 1: Summary of Correlation Analysis of Perspective of Blended Learning and Teacher's Attitude

Independent Variable	**Dependant Variable**		**r**	**p**	**Relationship**
Perspective of Blended Learning	Skill	Knowledge	.121	.456	positive, weak
		Drawing Accuracy	.259	.106	positive, weak
		Visualization Skill	.202	.212	positive, weak
		Completion Time	.439	.005	positive, moderate
	Motivation		.770	.000	positive, strong
	Learner Autonomy		.504	.001	positive, strong
Perspective of Teacher's Attitude	Skill	Knowledge	-.046	.777	none
		Drawing Accuracy	-.024	.883	none
		Visualization Skill	.133	.414	positive, weak
		Completion Time	.114	.485	positive, weak
	Motivation		.735	.000	positive, strong
	Learner Autonomy		.541	.000	positive, strong

It had shown that both student's perspective of blended learning and teacher's attitude had a strong and significant effect on their motivation and learner autonomy but no significant effect on their 3D drawing skills. Therefore, hypotheses H_4 and H_5 were partially supported in terms of motivation and learner autonomy only.

Finally, the Regression Analysis conducted had shown that the independent variables 'perspective of blended learning' and 'perspective of teacher's attitude' do not significantly predict the respondent's knowledge, drawing accuracy and visualization skills, but significantly predict completion time, motivation and learner autonomy.

CONCLUSION

This preliminary study was conducted to determine whether blended learning can serve as a practical and effective pedagogical practice in technical art subjects/courses particularly in teaching and learning 3D drawing at secondary school level by investigating its effect on secondary school students' 3D drawing skills, motivation and learner autonomy after the implementation of blended learning approach.

It was found that there was a significant difference in the student's level of 3D drawing skills, motivation and learner autonomy after using the blended learning approach. This study also

revealed that the student's attitude towards blended learning and perception of teacher's attitude had a strong and significant effect on their motivation and learner autonomy but no significant effect on their 3D drawing skills.

In short, it can be concluded from this study that implementing blended learning in 3D drawing module for secondary school can be effective in improving students' 3D drawing skills, motivation, and learner autonomy. Therefore, it is recommended for arts and design teachers or instructors to integrate blended learning in a classroom practice. It will also gradually reduce teachers' work load, and make the teaching and learning process more organized, time and money efficient, more fun and flexible for students.

REFERENCES

Abdulrasool, S., Mishra, R., & Khalaf, H. (2010). Teachers' and Students' Attitudes Towards Traditional and Computer Assisted Blended Teaching and Learning Processes in Mechanical Engineering Subjects Area. *Proceeding of 10th IEEE International Conference on Computer and Information Technology* (pp. 1436-1441). United Kingdom: University of Huddersfield.

Andreas Ahrens, Jeļena Zaščerinska & Natalia Andreeva. Engineering Students' Blended Learning in Higher Education. *Proceeding of the International Scientifical Conference, Volume I*.

Baldwin-Evans, K. (2006). Key steps to implementing a successful blended learning strategy. *Industrial and Commercial Training, 38*(3), 156-163. doi:10.1108/00197850610659427

Banks, J. (2001). *From boring to "Blackboarding": Building participation through VLE group work*. Retrieved from http://cebe.cf.ac.uk/learning/casestudies/case_pdf/jbanks.pdf

Barshay, J. (2011). Blended learning for the little ones. (Cover story). *Education Week*, 31(9), pp.1-14.

Bayram Güzer & Hamit Caner. (2013). The past, present and future of blended learning: an in depth analysis of literature. *Procedia - Social and Behavioral Sciences* 116 (2014), pp. 4596 – 4603.

Beadle, M., & Santy, J. (2008). The early benefits of a problem-based approach to teaching social inclusion using an online virtual town. *Nurse Education in Practice, 8*(3), 190-196. doi:10.1016/j.nepr.2007.07.004

Bliuc, A. M., Goodyear, P., & Ellis, R. A. (2007). Research focus and methodological choices in studies into students' experiences of blended learning in higher education. *The Internet and Higher Education, 10*(4), 231-244. doi:10.1016/j.iheduc.2007.08.001

Bogdan, Chiliban, Damaris, Căuneac & Marius Chiliban. (2012). Facilitating learning Using Modern E-Learning Tools in Technical Drawing and Infographics Teaching. *The 6th Balkan Region Conference on Engineering and Business Education, Sibiu, Romania* (Oct 18-21, 2012).

Boyle, T., Bradley, C., Chalk, P., Jones, R., & Pickard, P. (2003). Using blended learning to improve student success rates in learning to program. *Journal of Educational Media, 28*(2-3), 165-178. doi:10.1080/1358165032000153160

Chambers, M. (1999). The efficacy and ethics of using digital multimedia for educational purposes. In A. Tait & R. Mills (Eds.), *The convergence of distance and conventional education*: *Patterns of flexibility for the individual learner* (pp. 5-16). New York, NY: Routledge.

Cohen, K. E., Stage, F. K., Hammack, F. M., & Marcus, A. (2012). *Persistence of master's students in the United States: Developing and testing of a conceptual model*. USA: PhD Dissertation, New York University.

Donnely, R. (2010). Harmonizing technology with interaction in blended problem-based learning. *Computers & Education*, 54(2), 350-359.

Dziuban, C., Hartman, J., Juge, F., Moskal, P., & Sorg, S. (2006). Blended learning enters the mainstream. In C. J. Bonk & C. R. Graham (Eds.), *Handbook of blended learning: Global perspectives, local designs* (pp. 195-208). San Francisco, CA: Pfeiffer.

Garnham, C., & Kaleta, R. (2002). Introduction to hybrid courses. *Teaching with Technology Today, 8*(6). Retrieved from http://www.uwsa.edu/ttt/articles/garnham.htm

Garrison, D. R., & Vaughan, N. D. (2008). *Blended learning in higher education: Framework, principles, and guidelines*. San Francisco, CA: Jossey-Bass.

Garrison, D.R., & Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education. *Journal of Internet and Higher Education, 7*(2), 95-105.

Ginns, R., & Ellis, R. (2007). Quality in blended learning: Exploring the relationships between on-line and face-to-face teaching and learning. *The Internet and Higher Education, 10*(1), 53-64. doi:10.1016/j.iheduc.2006.10.003

Graham, C. R. (2006). Blended learning systems: Definitions, current trends and future directions. In C. J. Bonk, & C. R. Graham (Eds.), *The Handbook of blended learning: Global perspectives, local designs* (pp. 3-21).San Francisco: Pfeiffer.

Harris, P., Connolly, J., & Feeney, L. (2009). Blended learning: Overview and recommendations for successful implementation. *Industrial and Commercial Training, 41*(3), 155-163. doi:10.1108/00197850910950961

Haryani Haron, Wan Faezah Abbas & Nor Aini Abd Rahman (2012). The Adoption of Blended Learning among Malaysian Academicians. *Proceeding of the 3rd International Conference on e-Learning ICEL 2011* (pp. 175-181). Bandung, Indonesia.

Hofmann, J. (2014). Solutions to the Top 10 Challenges of Blended Learning. Insync Training. Retrieved from https://www.insynctraining.com/pages/SolutionstotheTop10ChallengesofBlendedLearning.pdf

Horn, M.B. and Staker, H. (2011). Classifying K–12. *Blended learning*. Innosight Institute.

Joanna Poon (2013). Blended Learning: An Institutional Approach for Enhancing Students' Learning Experiences. *MERLOT Journal of Online Learning and* Teaching, Vol. 9, No. 2, June 2013.

Katrina Bushko (2017). How Malaysian schools are tackling blended-learning challenges. Retrieved from https://www.christenseninstitute.org/blog/malaysian-schools-tackling-blended-learning-challenges/

Kenney, J. and Newcombe,E. (2011). Adopting a blended learning approach: Challenges encountered and lessons learned in an action research study. *Journal of Asynchronous Learning Networks,* Vol. 1, No. 1, pp. 45-57.

Lebow, D. (1993). Constructivist values for instructional systems design: Five principles toward a new mindset. *Educational Technology Research & Development, 41*(3), 4-16. doi:10.1007/BF02297354

Lim, D. H., & Morris, M. L. (2009). Learner and instructional factors influencing learning outcomes within a blended learning environment. *Educational Technology & Society*, *12*(4), 282-293. Retrieved from http://www.ifets.info/journals/12_4/24.pdf

López-Pérez, M., Pérez-López, M. C., & Rodríguez-Ariza, L. (2011). Blended learning in higher education: Students' perceptions and their relation to outcomes. *Computers & Education*, *56*(3), 818-826.

Mason, R., & Rennie, F. (2006). *E-learning: The key concepts*. Abingdon, UK: Routledge.

Md.Nasir, I. (2013). Bahasa Visual. *KUPAS SENI: Jurnal Seni Dan Pendidikan Seni*, Vol.1(2013), 19–25.

Mitchell, A., & Honore, S. (2007). Criteria for successful blended learning. *Industrial and Commercial Training*, *39*(3), 143-149. doi:10.1108/00197850710742243

Mohd Saidi Yusof , Che Soh Said , Mohammad Rusdi Mohd Nasir & Adnan Rozali (2017). Application of Virtual Reality Technology in Developing Courseware Terengganu's Malay Traditional House. *KUPAS SENI: Jurnal Seni dan Pendidikan Seni*, 2017 Vol. 5, Issue 1, pp76-86

Mugenyi Justice Kintu & Chang Zhu (2016). Student Characteristics and Learning Outcomes in a Blended Learning Environment Intervention in a Ugandan University. *The Electronic Journal of e-Learning*, Volume 14 Issue 3 2016, (pp. 181- 195).

Naemah Abdul Wahab, Jamal Othman & Saiful Nizam Warris (2016). Blended Learning In Higher Education: An Overview. Volume 5 Issue 2 2016 *e-Academia Journal UiTMT* (http://journale-academiauitmt.edu.my/)

O'Toole, J. M., & Absalom, D. J. (2003). The impact of blended learning on student outcomes: Is there room on the horse for two? *Journal of Educational Media, 28*(2-3), 179-190. doi:10.1080/1358165032000165680

Owston, R., Wideman, H., Murphy, J., & Lupshenyuk, D. (2008). Blended teacher professional development: A synthesis of three program evaluations. *The Internet and Higher Education, 11*(3-4), 201-210. doi:10.1016/j.iheduc.2008.07.003

Sevgi Ozkan, Refika Koseler & Baykal (2009). Evaluating Learning Management Systems: Hexagonal E-Learning Assessment Model (HELAM). European and Mediterranean Conference on Information Systems 2008 (May 25-26 2008), Al Bustan Rotana Hotel, Dubai.