

SUPPORTING LANGUAGE LEARNING FOR HEARING IMPAIRED STUDENTS THROUGH BLENDED LEARNING

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Abstract

The struggles of hearing impaired students with reading, writing, and communication in mainstream classrooms have been well documented in the literature over the past two decades. With the proliferation of ubiquitous web-based technologies, there is a need to explore how technologies will help hearing impaired students in learning a second language. This study investigates the learning experiences of a group of hearing impaired students' (N=14) learning the *AK403 Communication in English 3* course conducted in a blended learning (BL) environment in a Polytechnic in Malaysia. Specifically, learning experiences were examined in the form of (1) the hearing impaired students' perception towards the BL approach, and (2) the learning experiences supporting or impeding their learning using the BL approach. To gain an appreciation of the hearing impaired students' experience with the BL system; both qualitative and quantitative techniques were used, namely a survey consisting of open and closed questions, and focus group interviews. Findings revealed the hearing impaired students' have positive perceptions of the blended course. The BL platform afforded a few benefits but also posed a number of challenges for the students. Implications on how to better improve the blended learning environment were also discussed.

Keywords: Blended learning, hearing impaired students, online learning

Introduction

Polytechnics offer skill certificate programmes for students with special needs. The entry requirements for students with special needs applying for skill certificate programme in Malaysia Polytechnics are based on the criteria that they must have completed Form 5 at Special Education School or Special Education Integrated Programme from the Ministry of Education, Malaysia. Entry requirements aside, students with special needs, particularly those who are hearing impaired, have been well documented in the literature over the past two decades, to have struggled with reading, writing, and communication in the mainstream classrooms (Long & Beil, 2005; Mallory & Long, 2002; Johnson & Johnson, 1986). At the same time, with the rapid development of technology, technology-based learning has

taken a foot-hold in the teaching and learning environment. However, despite the vast interest amongst researchers towards teaching-learning innovations (Cuban, 1986, 2001; Kent & McNergney, 1999 cited in Wang & Hannafin, 2005) there is still little direct influence on the practice of technology-based learning amongst students with special needs, even though review of learning technology applied in the field of special education have claimed that; technology-based learning has not only helped improve academic achievement, but also made learning activities easier (Liu, Wu, & Chen, 2013; Chiang & Jacobs, 2010).

Taking cognizance of this lacuna in the literature, a study was undertaken to just that. Towards this end, two classes of hearing impaired students (N=14) from a Politeknik in Kota Kinabalu signed up for the *AK403 Communication in English 3* course that was conducted in the blended learning (BL) mode. Specifically it examines the learning experiences of the final semester hearing impaired students' attempts via the blended approach to learning. Learning experiences were examined in the form of the hearing impaired students' perception towards the BL approach, and the learning experiences supporting or impeding their learning using the BL approach.

It is hoped that the findings obtained will help throw more light into what works and what does not work in a BL environment in order to better understand the affordances and challenges faced in the introduction of the BL environment with the hearing impaired students. Findings obtained from this study not only provide useful feedback regarding the hearing impaired students' learning experiences and course planning and delivery, but also feed-forward to improving hearing impaired students' future learning and future course planning, implementation and evaluation.

What Is Blended Learning?

Recently, blended learning (BL) is becoming increasingly significant to complement traditional forms of teaching in the context of higher education (Mitchell & Forer, 2010). There are manifold definitions of Blended Learning, but to Garrison and Kanuka (2004), BL is a combination of traditional face-to-face (F2F) classes with web-based material. It describes a learning environment that either combines teaching methods, delivery methods, media formats or a mixture of all these. Moebs & Weibelzahl (2006) added that BL refers to the integrated learning activities such as a mixture of online and face-to-face learning. Leakey and Ranchoux, (2006) describe BL as an eclectic mixed of learning modes. Singh (2003) further elaborated BL as consisting of a set of learning strategies or dimensions that mixes various event-based activities, including traditional instructor-led training, synchronous online conferencing or training and asynchronous self-paced study. Sharpe et al. (2006) aptly summed up that the term BL as being difficult to define because it can mean different things to different people, institutions, or organisations.

Thus, amalgamating all the aforementioned definitions, BL can be summarised to consist of:

- 1) The integration of traditional learning with web-based on-line approaches; and
- 2) The combination of a number of pedagogical approaches, irrespective of the learning technology used.

Based on the two common definitions, BL can be described as a hybrid learning model where more than one delivery mode is used to optimise the learning outcomes. BL often brings together traditional learning and e-learning modes. Figure 1 constructs the spectrum of delivery mode in terms of time and space, and illustrates the relationship between traditional learning, e-learning and blended learning. As shown in Figure 1, the one-place-same-time traditional face-to-face classroom teaching fits at one end of the spectrum of the

learning delivery mode, then pure e-learning fits on the other end. The traditional learning style offers the learner face-to-face contact and support, whereas e-learning can be delivered anywhere, anytime (asynchronously), for example at the learner's home or workplace. BL overlaps with both ends of the spectrum and occupies a wide range in the middle.

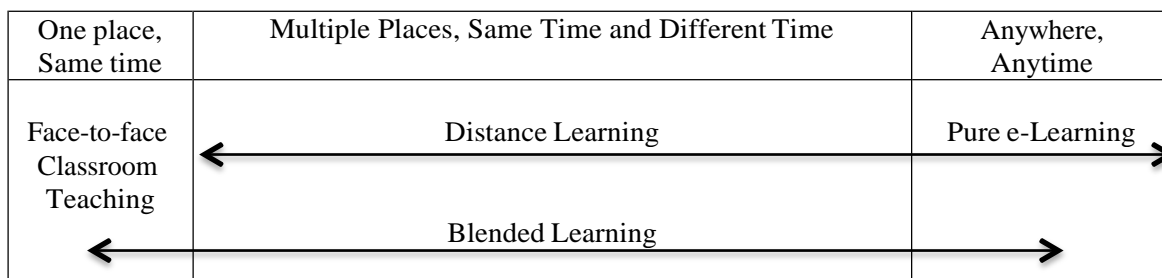


Figure 1 – Spectrum of Delivery Modes Source: Modified from Maguire and Zhang (2006)

Having dealt with the multi-dimensional definitions of BL, a review of the advantages offered by BL to higher education is next presented. There are numerous claims being made about the advantages of BL. Singh (2010), for example, argues that BL resource provides greater opportunities to comprehend and extend the knowledge presented. Sharpe & Benfield (2005), on the other hand, discussed on the advantages offered based on the different methods of teaching and on the innovation introduced. Lim & Morris (2009) looked at students' experiences with the BL approach.

The use of ICT in higher education, particularly with hearing impaired students require an evaluation of the contribution of these tools to students' learning, especially when they are used as a complement to the more conventional face-to-face (F2F) methods (Ginns & Ellis, 2009). Therefore, the main purpose of the study is to examine the hearing impaired students' experiences of the BL process. Specifically, the learning experiences were examined in the form of (1) the hearing impaired students' perception towards the BL approach, and (2) the learning experiences supporting or impeding their learning using the BL approach.

Research Questions

To this end, two main research questions were formulated, namely:

- (1) What are the hearing impaired students' perceptions towards the BL approach?
- (2) What learning experiences supported or impeded the hearing impaired students' learning via the BL approach?

Methodology

Participants

A total of 14 hearing impaired students participated in the study. These students were the final semester students pursuing a skill certificate programme in Hotel and Catering for students with special needs. These students are all from the island of Borneo Malaysia, namely the states of Sabah and Sarawak. Their age ranges from 19s to 21s. For the majority of the hearing impaired students, this was their first experience in using an e-learning platform, although most had previously informally used the web to gather information, or prepare coursework in the college.

Course Design and Modules

This paper focused on teaching and learning of *AK403 English for Communication 3* to two classes of final semester students in a skill certificate in Hotel and Catering programme. The course was delivered using a blended learning approach which involves 54 hours of student learning time (SLT) and was typically organised based on

(a) 30 hours of face-to-face lectures and tutorials; (b) 16 hours of self- preparation and e-learning which involves online discussion and online quizzes, completing the exercises and reading interactive quizzes hosted on an LMS with social networking capabilities called Schoology; and (c) 8 hours of preparation for assignments and presentation. Table 1 summarises the allocation of study hours for each course.

Table 1- Allocation of Study Hours

Activity	No of hours
Attending F2F lecture and tutorial sessions (each of 2 hours duration for 15 weeks)	30
E-learning comprising participating in online discussion and online quizzes, completing the exercises	16
Preparation for assignments and presentation	8
Total	54 hours

Schoology Learning Management System

The main e-learning platform used was the free cloud-based Learning Management System, known as Schoology. Schoology was preferred to the polytechnic's moodle-based Learning Management System (Cidos) due to two principal reasons. Firstly, Schoology is easier to access, compared to campus-based LMS (Cidos) due to the rigidity and less-user friendly features for the hearing impaired learners. Moreover, Schoology is accessible via mobile apps which greatly facilitate access. Thirdly, the participants preferred Schoology because it offers social networking features (see Figure 3), much akin to the popular Facebook tool used by most of the students. Principally, Schoology consists two main contexts 1) interactive communication and 2) academic information exchange (Manning et al., 2011). The facility for interactive communication permits students to create discussion questions, collaborative groups for assignments that allow some kind of dynamic interaction among the students and their teachers. As for the second aspect of academic information exchange, Schoology provides the students the opportunity to access their grades, attendance records and teacher feedback on electronically-submitted assignments. In short, via Schoology, a range of different e-learning tasks and assessments were included to complement the traditional intensive face-to-face meetings.



Figure 2 - Interface of AK403 Course hosted on Schoology LMS

Instruments

To probe the students' learning experiences, both quantitative and qualitative data were collected via questionnaires and focus group interviews. The survey and focus groups interviews gathered the most relevant data of the hearing impaired students' experiences of the blended learning process, as well as the challenges faced in learning how to learn in a blended environment.

Quantitative Data – Questionnaire

A post-Likert scale questionnaire was designed and used to gather students' opinions and views of the BL system (see Appendix A). At the end of Semester 4, all the 14 hearing impaired students were given a questionnaire to elicit their feedback of the blended learning environment. The hard copy of the questionnaires were given to all the respondents at the end of the class. The questionnaire consists of questions related to their overall impressions of the BL environment, Schoology, learning materials, and demographic data of the respondents. A Likert-type scale from 1 to 5 (Strongly Disagree (SD), Disagree (D), Unsure (U), Agree (A), Strongly Agree (SA)) was used (the scale is in reverse for negative items). To facilitate easier understanding, the questionnaire was administered using sign language item by item. In total, all 14 questionnaires were returned and analysed. The data obtained from the questionnaires was descriptively analysed.

Qualitative Data – Focus Group Interviews

For qualitative data, focus-group interviews were conducted involving all 14 hearing impaired students. The students were put into three groups consisting of two groups of five and one group of four for the focus group interviews. The first and third authors moderated the sessions together as they were competent in using sign languages to communicate with the hearing impaired students. To ensure robustness and accuracy of interpretation, the interviews were video-taped and transcribed. The interview transcripts were then content analysed to find similarities and differences of common ideas and beliefs before being coded into categories and themes. To ensure accuracy and

credibility in coding, member checking was carried out by two other members of the research team.

Data Analysis

Quantitative data were analysed to examine hearing impaired students' perceptions of the BL environment. Qualitative data were thematically analysed and coded iteratively using Nvivo based on criteria of saliency and saturation (Lincoln & Guba, 1985). Credibility was addressed based on the techniques of prolonged engagement, triangulation, and referential adequacy (Lincoln & Guba, 1985). To ensure referential adequacy, attempts were made to capture and document the data in their original form. Verbatim quotes were used in some instances to give a flavour of the hearing impaired students' experiences in the blended learning environment.

Findings and Discussions

Findings are presented based on the order of the research questions posited:

What is the hearing impaired students' perception towards the BL approach? Based on the 15-item questionnaire that focuses on eliciting perceptions about their overall impressions of the BL environment, Schoology learning management system, and learning materials, findings revealed that a vast majority of the hearing impaired students had positive perceptions of the blended course design and Schoology as a platform for learning.

The efficacy of the BL approach (Items 1 to 9) received resounding endorsements from the students (see Table 2). All 9 items recorded a mean score of 4 and above, indicating that the students have positive attitudes towards the BL approach that they have gone through.

Table 2 - Mean Score of Questionnaire Items Concerning Students' Attitude Towards BL

	Mea	SD
1. I like the use of BL in this course.	4.21	.579
2. BL helped me learn better.	4.57	.514
3. Applying BL for this course was more delightful and relaxing than traditional methods.	4.29	.726
4. With BL, I get access to both printed and online materials which helped me learn better.	4.43	.646
5. With BL, I get to do online quiz.	4.43	.514
6. Applying BL in learning this course helped me to improve my reading and writing skills.	4.43	.646
7. Applying BL for this course enhanced the chance for interaction with the teachers.	4.57	.514
8. By applying BL for this course, the chance for interaction with my classmates was enhanced.	4.36	.842
9. I enjoyed talking to others about BL.	4.14	.770

In terms of the perception of the benefits of BL to their learning, the hearing impaired students indicated that they have gained improvement in their learning. Most of the students indicated that BL helped them to learn better (Item 2), improved their

skills in writing and reading (Item 6), enhanced their interactions with their teachers (Item 7), and their peers (Item 8). In overall term, all the 9 items aimed at eliciting the hearing impaired students' perceptions of BL approach recorded mean of above 4, indicating a positive perception of the BL approach.

Likewise, items focusing on the learning platform used (Schoology) were also positively endorsed. As shown in Table 4, the application of the Schoology platform in BL indicated that it consisted of "ease of use" features (Item 12, 15), and indicated to have improved their ICT skills (Item 13, and 14). The students also agreed that the online activities provided in Schoology were relevant and related to the course objectives.

Table 4 - Mean Score and Standard Deviation Scores of Questionnaire Items Concerning Students' Perception of Schoology in BL (N=14)

	Mea	SD
11. The online activities on Schoology were related to the Learning Objectives (CLO).	4.43	.64
12. Schoology was easy to use.	4.43	.64
13. Using Schoology improved my computer skills.	4.14	.53
14. Schoology helped me to use internet effectively.	4.21	.69
15 The instructions provided in Schoology were easy to follow.	4.21	.69

Analysis on data from the open-ended items seems to corroborate with the findings of the closed-ended items. The hearing impaired students pointed to the flexibility that the online component offers as a major advantage. The availability of Schoology app on their mobile phones allow them to work whenever it suits them best and when they can perform most productively. Another aspect of the blended learning model that was viewed favourably by students was the doing online quiz which they found as helpful and interesting. The hearing impaired students were required to do their assignments in groups and claimed that with Schoology, their friends could help and support them if they did not understand some of the tasks.

In terms of negative experiences, all the 14 hearing impaired students echoed slow internet access being the biggest stumbling block. One of them claimed that wifi access was too slow to facilitate online learning.

What Learning Experiences Supported Or Impeded Hearing Impaired Students' Learning Using The BL Approach

The focus group interview was thematically analyzed in an attempt to understand the BL experiences of the hearing impaired students, viewed in terms of affordances and challenges faced. Analysis yielded six categories, grouped under two dominant themes which are affordances and challenges as shown in Table 5 and Figure 4.

Affordances

The first theme generated is the factor of affordances/benefits. An *affordance* is a quality of an object, or an environment, which allows an individual to perform an action ⁷ (Wikipedia, free encyclopedia). In this study affordances are attributed to the unplanned outcomes that emerged from the BL environment. Benefits, on the other hand, are defined as the advantages and positives derived from the learning outcomes of the AK403 Communication in English 3 and the BL environment. Grouped under theme of benefits are the categories of (1) ICT skills; (2) Communication Skills; and (3) Positive attitudes. This theme recorded the highest number of counts, totalling 26 instances. It appears the course activities and the BL learning approach had helped improve the hearing impaired students' ICT and communication skills. The students also claimed that BL have helped instilled a positive attitude in them to learn harder. The majority of the students appear to acknowledge that the BL and the assignment given had improved their technological skills. The following quotes, taken from the focus group interviews, provide a flavour of the perceived advantages of BL by the hearing impaired students:

"I get to improve my ICT and communication skills when I do the online tasks and activities provided by the teachers. I can learn and increase my knowledge."

"the online discussion is interesting. Now I'm more interested to learn the course."

"I like learning from my friends and their opinions and beliefs about the things we learn in class."

"I liked how I was able to interact more with other students using Schoology"

It appears that the Schoology learning platform is used to help them to share knowledge or information, and to discuss and complete their assignments. Interestingly, the hearing impaired students did not rely exclusively on Schoology, instead they also used other social media apps for communication such as *Whatsapp*, *Telegram*, *Skype* and *Facebook*.

Table 5 - Qualitative Data: Coded Themes and Categories

	Themes	Frequenc	Categories	Frequenc
1	Affordances/Benefits	26	ICT skills	12
			Communication skill	8
			Positive Attitudes	6
2	Challenges	27	Internet connectivity	14
			Time constraint	8
			Unhelpful group members	5
	Total	53		57

Challenges

The second theme generated relates to the factor of challenges. Challenges in this study are deemed as learning experiences that impeded or perceived as problems affecting the hearing impaired students' learning experiences. In terms of frequency count, this theme recorded the highest number of counts, amounting to 27 instances.

The four main categories making up this theme are:

1. Internet connectivity
2. Time
3. Unhelpful group members
4. Language barrier

Internet connectivity was found to be the biggest challenge facing the implementation of the BL approach. Most students complained that accessing available and working Wi-Fi hotspot around the campus to be a problem. Most of them could not afford a pre-paid data plan and as such had to rely on some of their friends who owned one to share.

This gave rise to another challenge concerning unhelpful friends who refuse to share their internet access. The lack of internet access seemed to have disrupted their collaboration and gaining access to the resources provided in the learning environment, in particular gaining access to Schoology.

The lack of time was also another constraint to the implementation of the BL approach. Some of the students complained of insufficient time to complete the activities provided in Schoology as they have to juggle their time with other tasks and activities demanded of them from other courses. They also complained that more time should be allotted for them to discuss the tasks together with their peers and submit their discussions. The following quotes, extracted from the focus-group interviews, provide a summary of the challenges faced by the hearing impaired students:

“Accessing the internet is very difficult in Poly.”

“I have to log on many times to post my discussion to Schoology...but still cannot get in”

*“Some of my friends do not want to share their modem...they **kedekut** (stingy)”*

“Time not enough to do the tasks...got other assignments also”

In summary, findings thus far revealed that implementing the BL approach has its fair share of advantages and challenges. In overall terms, the hearing impaired students generally have positive perceptions of the BL course design. The impact of the BL environment on the hearing impaired students' personal development, and in particular towards their attitude to learning, also emanated strongly from the focus group discussions. In particular, two themes seem particularly dominant: (a) BL fosters greater ICT and communication use amongst the students, thereby engendering greater investment of time and effort in learning the course; and (b) BL approach helped them to become more independent learners, particularly in managing their time for learning. However, there were also a number of drawbacks mentioned, in particular, poor internet connectivity, and lack of time provided by tutors and peers in relation to task discussion, and unhelpful friends, particularly in their unwillingness to share internet access and provide help to their more cognitively challenged friends.

Conclusion

This study sets out to investigate two main issues; firstly to find out the extent in which the BL approach which combines the traditional classroom learning, tutorial with web-based learning help the hearing impaired students in learning the *AK403 English for Communication 3*, and secondly to investigate and find out more about the learning experiences brought about by the BL system with the group of hearing impaired students. On the basis of the findings presented and discussed thus far, it appears that the hearing impaired students had positive perceptions of the blended course design and Schoology as a platform for learning. The findings seemed to support the positives elements posited by Singh (2010) that BL resource provides greater opportunities to comprehend and extent the knowledge presented.

However, there are a number of areas of concern that need further attention and fine-tuning if these positive experiences are to be further enhanced, particularly the challenges faced involving internet connectivity and time provision for managing learning with students with special needs. It appears that for effective learning to take place, course instructors, education service providers and all stakeholders who have stakes in educating students with special needs to continuously carry out monitoring and evaluation of the programme they are offering. Based on the findings presented, it appears that to optimise successful blended learning, efforts need to be expanded to understand the pedagogical attributes and affordances of new and emerging learning technologies, the most desirable aspects of face-to-face teaching and the ways in which these aspects can be appropriately integrated. This study, although limiting in its scope and coverage, has answered Ginns and Ellis (2009) call to practitioners to evaluate the contribution of ICT tools to students' learning in higher education, especially when used as a complement to the more conventional F2F methods. Thus, for BL to work, more needs to be done than merely implement learning changes. A good platform to begin is to start understanding the affordances and the challenges faced in order to come up with solutions that work for all stakeholders involved.

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Appendix A: End-of-Semester Survey Form

	N	Mean	SD
1. I like the use of BL in this course.	14	4.21	.579
2. BL helped me learn better.	14	4.57	.514
3. Applying BL for this course was more delightful and relaxing than traditional methods.	14	4.29	.726
4. With BL I get access to both printed and online materials which helped me learn better.	14	4.43	.646
5. With BL, I get to do online quiz.	14	4.43	.514
6. Applying BL in learning this course helped me to improve my reading and writing skills.	14	4.43	.646
7. Applying BL for this course enhanced the chance for interaction with the teacher.	14	4.57	.514
8. By applying BL for this course, the chance for interaction with my classmates was enhanced.	14	4.36	.842
9. I enjoyed talking to others about BL.	14	4.14	.770
10. With BL, I. get to know and use Schoology.	14	4.50	.519
11. The online activities on Schoology were related to the Course Learning Objectives (CLO).	14	4.43	.646
12. Schoology was easy to use.	14	4.43	.646
13. Using Schoology improved my computer skills.	14	4.14	.535
14. Schoology helped me to use internet effectively.	14	4.21	.699
15 The instructions provided in Schoology were easy to follow.	14	4.21	.699