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**SIZING-UP STUDENTS'  
COMPETENCIES FOR SUCCESSFUL  
BLENDED LEARNING**

**EVALUANDO LAS CAPACIDADES DE  
LOS ESTUDIANTES PARA UN  
EXITOSO APRENDIZAJE  
COMBINADO**

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## ABSTRACT

Expanding opportunities in tertiary level education requires a serious examination of student technical competencies, curriculum and methods of delivery. Face-to-face and online learning delivery methods incorporate technical skills needed for blended learning. This study reports on a technical competency survey administered at the University of the West Indies Cave Hill Campus. The results show that students lacked the necessary face-to-face technical skills required to create multimedia presentations; advanced word processing skills; as well as many of the skills needed to create spreadsheet and database applications. While most students possess the necessary skills for online learning, certain crucial abilities were lacking: for example, nearly half of the students surveyed indicated that they had difficulty searching online databases and creating email filters. This paper concludes by providing recommendations for enhancing a curriculum which includes technical skills training that supports successful blended learning. The findings of this research will assist and guide future creators of blended learning environments.

## RESUMEN

El incremento en las oportunidades para la educación superior requiere un serio examen de las capacidades técnicas del estudiante, del plan de estudios y de los métodos para la entrega [de sus trabajos]. Los métodos de entrega en el aprendizaje cara a cara y en línea incorporan habilidades técnicas necesarias para el aprendizaje combinado. Este estudio presenta los resultados de una encuesta sobre capacidad técnica, aplicada en la Sede de Cave Hill de la Universidad de las Indias Occidentales. Los resultados demuestran que los estudiantes carecían de la capacidad técnica requerida para la creación de presentaciones multimedia, conocimientos avanzados para el procesamiento de textos, así como muchas de las habilidades necesarias para crear hojas de cálculos y bases de datos. Aunque la mayoría de los estudiantes poseían la destreza necesaria para el aprendizaje en línea, carecían de ciertas capacidades cruciales. Por ejemplo, casi la mitad de los estudiantes encuestados indicaron que tenían dificultad para la búsqueda en línea de bases de datos y para crear filtros de correo electrónico. En la conclusión de este trabajo se proporcionan recomendaciones para un plan de estudios mejorado que incluya entrenamiento técnico orientado a lograr un exitoso aprendizaje combinado. Los resultados de esta investigación servirán de asistencia y dirección para los futuros creadores de ambientes de aprendizaje combinado.



## INTRODUCTION

Sizing up students' abilities is a primary investigation that educators undertake before planning curriculum or instruction. Usually it is based on an informal observation of perceptions, impressions and soft data. However in this study, sizing-up is used as a formal skills assessment of students' ability to use certain technology tools. Sizing up assessment provides initial information about students that will help in the planning of blended learning curricula. In order to expand blended-learning opportunities, special attention needs to be paid to students' abilities and competencies in technology before methods of delivery are considered.

The technological skills needed in face-to-face learning include word processing, presentation tools and other software applications. The skills needed for online learning (in synchronous and asynchronous modes) include: downloading of files, viewing of web pages; searching the internet for information; chatting; sending and receiving email; handling junk mail; and creating email filters.

In the remainder of this paper the importance of this study will be outlined; the theoretical framework presented; the purpose of the study described; the research questions listed; the methodology presented; the results detailed; and recommendations provided.

## IMPORTANCE OF THE STUDY

Sizing up assessments are conducted by educators to guide students' interest in content or to determine the abilities and competencies of student cohorts. The value of sizing up students lies in the information obtained from the exercise, since it helps to create obtainable and sustainable learning goals and informs faculty of the technical abilities of students prior to planning blended learning.

Kim and Bonk (2006) state that online learning is becoming a long-term strategy for higher education institutions. According to the results of their survey on online teaching and learning, blended learning is an increasing trend for universities. Over eighty percent of students predicted that all courses would have some form of online component by 2013. Therefore, the relevant technical abilities of students should be of great concern to both students, lecturers, and administrators.

Several studies have examined students' competencies in the use of technology tools: Haywood, Haywood, Baggetun, Harskamp and Tenhonen (2004), Kvavik & Caruso (2005) and Davis, Smith, Rodrigue and Pulvers (1999), among others. Haywood *et al.* (2004) and Kvavik & Caruso (2005) compared and contrasted students' technical skills, while

Hawkins & Paris (1997) and Davis *et al.* (1999) studied students' Internet-related abilities.

This cornucopia of studies which focus on assessing students' technical abilities all point to the crucial need to study the technical abilities of Caribbean students before designing instruction.

### **THEORETICAL FRAMEWORK**

Blended learning is simply defined as "instruction that combines face-to-face with online offerings" (Kim and Bonk, 2006). Blended learning generally occurs when students attend courses administered face-to-face but receive administrative direction from their instructors via an online management system. These types of system are commonly known as Learning Management Systems (LMS) or Course Management Systems (CMS). Herein, Online Management Systems (OMS) will be used to refer to both LMS and CMS software.

The features that students encounter when using OMS technology are usually posted syllabi; online readings; grades on assignments; turning in assignments online; discussion boards; and taking exams or quizzes. The Kvavik & Caruso (2005) study gave a detailed account of these features; however, the technical skills required for learning with OMS were not queried. Kim and Bonk indicated that OMS are designed to manage learners rather than integrate interactive emerging technology such as video streaming, learning object libraries, or online exams.

Students require specific technical skills to operate efficiently in a face-to-face or online environment. Common applications used in face-to-face learning are word-processors, presentation software, spreadsheets and databases (Grant, 2004). For online learning, students require the ability to upload and download files; view web pages; search the Internet for information; chat (synchronous communication); send and receive emails (asynchronous communication); handle junk mail; and create email filters. These skills are needed to manipulate OMS (such as Blackboard, eCollege, and Moodle).

Technology-mediated learning may be manifested in the use of pedagogical strategies via an online interface with or without using an OMS. Lofstrom and Nevgi (2007) revealed the value of sizing up students' computer skills with respect to technology-mediated learning. Even though the extent of students' computer skills was not a direct query, the Lofstrom *et al.* study suggested that students' lack of technological ability made it difficult for them to learn. Students tend to interface with technology better when they are comfortable with the given tool. This result corresponds to

the findings of Kvavik & Caruso (2005) that students seemed to value OMS more if they were experienced in using them; therefore, it appears that students' technical skills influenced their ability to learn in a blended learning environment.

In Keengwe's study (2007), students perceived that they needed direct instruction in the effective use of computer applications in order to improve their learning. The fact that students perceived such a deficit gives additional credence to the need for a curriculum which includes technical skills training.

#### **PURPOSE OF STUDY**

In order to expand teaching and learning at the tertiary level across the distributed environment of the Caribbean, a clear picture of students' technical competencies is needed; this will allow for curricula development and blended learning instruction to be properly planned. This research is intended to assist creators of learning environments in the establishment and subsequent provision of the pre-requisite technical skills for blended learning.

#### **RESEARCH QUESTIONS**

Three research questions were explored in this study, namely:

1. What technical skills do students possess for face-to-face learning?
2. What technical skills do students possess for online learning?
3. Do students possess the technical skills for interacting in a blended learning environment?

#### **METHODOLOGY**

##### *CONTEXT*

The University of the West Indies (UWI), Cave Hill campus is one of three campuses of the University of the West Indies. The Cave Hill campus, located in Barbados, has four Faculties: Humanities and Education, Pure and Applied Sciences, Social Sciences, and Law; and two Schools, namely the School of Clinical Medicine and Research and the School of Education.

The student population at the Cave Hill campus currently stands at nearly 7000 students with projections for 15000 or more by 2015. Students from ten Caribbean countries were represented in this study: Anti-

gua, Barbados, Grenada, Guyana, Jamaica, Montserrat, St Lucia, St Vincent, St Kitts, and Trinidad. Eighty-six percent of the respondents indicated that they were citizens of Barbados. Nearly five percent of the students were St Vincent citizens and two percent were citizens of St Lucia. St Kitts and Trinidad were equally represented at 1.3 percent each, with the rest of the countries under one percent.

#### *DATA COLLECTION*

The START<sup>2</sup> survey instrument was used for this study (Walcott, Grant & Depradine, 2008). The survey investigated demographic information; academic and computer experience; computer and Internet access; and technical skills. This paper and pencil survey which was conducted in September 2006 was administered to 397 students by faculty members during class time; there were 397 responses. All of the Faculties were included in the study except Law; the School of Clinical Medicine and Research and the School of Education were also not included. Scaling and analyzing of the survey was performed by members of START.

For the purpose of this paper, only those prompts relating to Caribbean students were considered; this totaled 387 students. In addition, only the technical skills related to a blended learning environment (face-to-face and online) were considered. This represented about 60% of the technical skills queried on the survey.

The technical skills investigated were related to the use of word-processing, spreadsheet, presentation, database and email software applications. In addition, online skills were also investigated, namely: viewing web pages; typing web addresses; shopping online; sending and receiving email; chatting; downloading of files; saving images from the Internet; searching the Internet for information, with and without the use of Boolean variables; blocking/unblocking pop-ups; and online telephony.

#### *LIMITATIONS*

This study was administered at the Cave Hill Campus and as a result a large proportion of the students were of Barbadian citizenship, some eight-six percent. It would therefore be useful to expand the study to the twelve University Centres which are located in the other Caribbean islands.

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2 Scholarship of Teaching through Action Research on Teaching Group, at the Cave Hill campus.

## RESULTS OF BLENDED-LEARNING SKILLS

### *WHAT TECHNICAL SKILLS DO STUDENTS POSSESS FOR FACE-TO-FACE LEARNING?*

Word-processing tasks could be performed by most of the students. Almost 98% could perform spell-checking; 95.9% could cut and paste; 92.8% could create bulleted and numbered lists; and 91.2% could use a thesaurus. A slightly smaller percentage could create tables, 89.7%; change bullet symbols, 88.4% set alignments/tabs, 85.5%; and set the language of the document, 84.2%.

Fewer students were able to perform the spreadsheet activities. About 86.3% of the students could insert/delete rows or columns; 78.8% could create charts/graphs; 71.1% could sort data; 70.8% could create fields; 66.9% could create formulae; and only 17.8% could create macros.

Presentation tools also seem to pose some difficulty for students. 69.8% of the students could save a PowerPoint document as a PowerPoint show; 59.7% could add animation; 57.1% could adjust the timing of slides for presentations; 55% could toggle between views; 51.7% could change templates; 49.9% could add sound and/or video; but only 39.8% could transfer or download templates from an external source.

For databases, 64.2% of the students could create a table; 58.3% could create database fields; 57.8% could add database records; 52.2% could create forms; 50.6% could sort a database; and 47.5% could perform a query.

### *WHAT TECHNICAL SKILLS DO STUDENTS POSSES FOR ONLINE LEARNING?*

A large percentage of the students were able to complete many of the online activities. Noticeably lower percentages of the students, however, were able to complete the activities of blocking/unblocking pop-ups; searching using Boolean variables; and online telephony.

A large percentage of students could search the Internet for information without Boolean variables, 95.3%. Almost ninety-five percent, 94.8% and 94.6% of the students respectively, said that they were able to send and receive email and view a web page. About ninety-two percent, 92.2% and 91.7%, respectively of the students could download files from the Internet and chat online. A moderate number of students, 83.5% could type internet addresses, while 82.4% could save images from the Internet. Almost seventy-one percent (70.8%) of the students could shop online, while 65.9% could block/unblock pop-ups.

Only 32.0% of the students could perform online telephony. Although a large number of students were able to search the Internet without the use of Boolean variables, a drastically lower percentage could conduct Boolean searches, namely 25.3%.

Approximately ninety-two percent (91.7) of the students were able to send and receive email; 82.7% could handle junk-mail; 81.4% were capable of editing email messages; 70.0% could create email groups; 49.1% were able to create email filters; and 48.6% could create email signatures.

*DO STUDENTS POSSESS THE PRE-REQUISITE TECHNICAL  
SKILLS FOR INTERACTING IN A BLENDED LEARNING  
ENVIRONMENT?*

It appears that students possess the skills needed to successfully interact in a blended learning environment that is primarily text-oriented. This is evident from the high percentage of students who were able to: search for information on the Internet (without Boolean variables); send/receive email; view web pages; and use word-processing and spreadsheet applications. The degree of adeptness with word processing applications implies that students have used this tool extensively during the preparation of research reports, essays and other assignments.

A further supposition is that teaching styles remain instructor-centered even when technology has been integrated, or a blending learning environment has been employed. This supposition is supported by the fact that students were less competent in student-centered activities, such as: searching the Internet using Boolean variables; transferring or downloading presentation templates from an external source; adding sound and/or video to a presentation; sorting a database; or performing a database query.

Student could add visuals to documentation such as tables, charts and graphs. This is additional evidence of the dominance of document production in the blended learning approach. Students were adept at using the Internet to search for information and to download files. Again, both of these are activities needed to support research paper production.

Student-centered learning activities such as presentations before peers using slide shows, moving between various slide views, using various design templates, animation and slide timing were problematic for students.

## RECOMMENDATIONS

The results of this work have highlighted that in order to expand teaching and learning at the tertiary level in the Caribbean, there is a need for training in the use of technologies that are required for blended learning. What is also evident is that there is a need to move away from instructor-centered learning to student-centered learning.

It is therefore the recommendation of the authors, that the current curriculum for students be expanded to include training in software applications required for student-centered learning. In addition, faculty members need to be trained in order to achieve the paradigm shift from instructor-centered learning to student-centered learning. Only if both of these are achieved will students and faculty members be truly ready for successful blended learning.

It is therefore recommended that the following three courses be introduced:

1. **Information Literacy.** This course will train students and faculty members on how to perform Boolean searches using online databases.
2. **Software tools.** Both students and faculty members need training in the use of application software, namely spreadsheets, presentation tools and databases.
3. **Seaching Methods.** Faculty members need to participate in seminars and workshops on methods of delivery.

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