

Online Education and Academic Performance: The Case of Online Tertiary Students in the Caribbean

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Online education in the Caribbean provides increased access to education by leveraging the opportunities offered by the Internet. However, high failure rates among online tertiary institutions result in unacceptable levels of attrition, reduced graduate throughput, and increased cost of training for a nation's labour force. Against this backdrop, this study analysed the perceptions of students' online learning experiences within the Caribbean in order to ascertain the major factors influencing their academic performance, with a view of instituting corrective measures to improve retention and academic performance. Data were gathered via an online survey, focus group discussion, and a learning style assessment. Analysis of the online survey administered to online tertiary students in the Caribbean indicated self-reported perceptions that work and family responsibilities, the pace of courses, quality of online course materials, and timeliness of tutors' feedback to assignments were some of the major factors impeding learning and academic performance. Other results revealed students' perceptions of tutors' effective use of online learning tools and students' perceived online learning tools that are best suited for improving their academic performance according to their respective learning styles and preferences.

Keywords: online education, academic performance, online learning tools, learning styles

Introduction

Worldwide, many programmes have been implemented to increase learning through the Internet, however, high failure rates at tertiary institutions result in unacceptable levels of attrition, reduced graduate throughput, and increased cost of training for a nation's labour force (Mlambo, 2011). Studies have proven that attrition is significantly higher for online students than for students attending traditional classrooms (Doherty, 2006; Patterson & McFadden, 2009). Much of the attrition that reduces retention can be attributed to low academic performance in early pre-requisite undergraduate courses (Scott & Graal, 2007). This raises a cause for concern as to the factors influencing low academic performance in the online learning environment and the interventions required to improve retention and academic performance.

Research Questions

Against this backdrop, this study analysed the perceptions of students' online learning experiences within the Caribbean in order to understand the higher than desired attrition rate and to identify interventions to improve retention and academic performance. By analysing the perceptions of students' online learning experiences, this study sought to answer the following research questions:

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1. What are the factors influencing the academic performance of online tertiary students in the Caribbean?
2. What online learning tools are perceived to be more effective in improving students' academic performance according to their respective learning style and preference?
3. How do students perceive tutors' effective use of online learning tools and its impact on their learning and academic performance?

Significance of the Study

An investigation of this nature contributes towards unravelling and addressing those major factors affecting the academic performance of online tertiary students in the Caribbean. Based on the factors identified, online tertiary institutions will be better able to tailor their programmes to the students' needs and preferences and utilise the lessons learnt to strengthen and improve the development and delivery of their course offerings. The knowledge gained from this study will be of great benefit to online facilitators, especially in the design of their teaching methodologies and delivery. Online facilitators will be better equipped with the knowledge of key online learning tools that will reap greater results in students' academic performance according to their respective learning style and preference. In addition, the body of knowledge garnered from students' perception of online facilitators' use of online learning tools will assist in identifying the gaps in effective teaching and engagement and allow online facilitators to better understand the expectations of online students and the ways in which their online teaching delivery can be improved. These efforts will certainly fight the battle of unacceptable levels of attrition in the online learning environment and uncover corrective measures for improving retention, learning, engagement, and academic performance.

Review of literature

Impact of Learning & Instructional Style on Academic Performance

Researchers have varied definitions of learning styles. Vorhaus (2010) defined learning style or preference as how an individual learns, perceives, interacts with, and responds to the learning environment. Whereas, Felder and Brent (2005) considered learning preferences or styles as about how the brain works most efficiently to process, comprehend, and learn new information. Varied definitions can point to major agreement that learning style is an individual's preferred way to learn, a definition that was set early in 1984 by Kocinski. Learning preferences are about the ways that people want to interchange information, and it includes auditory (learning by hearing), visual (learning by seeing), and kinesthetic (learning by doing) (Felder & Brent, 2005; Fleming, 2010).

An understanding of the learning styles and preferences of online tertiary students is very critical in order to design effective instructional strategies that are necessary to improve academic performance. One method that helps in acquiring information about students' learning styles is a questionnaire called VARK developed by Neil Fleming in 1998 (Murphy et al., 2004). VARK is an acronym for sensory modalities used to present information, V denotes Visual, A denotes Aural, R denotes Read/Write and K denotes Kinesthetic. According to VARK (2015a), visual learners prefer information to be presented on the whiteboard, flip charts, walls, graphics, pictures, and colours. In addition, aural learners prefer to sit back and listen to lessons or find it useful to record lectures for later playbacks and reference. Furthermore, read/write learners prefer to read the information on their own and take a lot of notes. These learners benefit from given access to additional relevant information through handouts and guided

readings. Finally, kinesthetic learners prefer to be actively involved in their learning and thus would benefit from active learning strategies in class. A study conducted by Leite, Svinicki, and Shi (2010) justified the reliability of the VARK questionnaire.

According to Harb and El-Shaarawi (2006), there is a good match between students' learning preferences and instructor's teaching style that has been demonstrated to have a positive effect on students' academic performance. In support, Omrod (2008) reported that some students seem to learn better when information is presented through words (verbal learners), whereas others seem to learn better when it is presented in the form of pictures (visual learners). Furthermore, Felder (1993) established that alignment between students' learning preferences and an instructor's teaching style leads to better recall and understanding. As a result, given that learners have different learning styles or a combination of styles, online educators should design activities that address their modes of learning in order to provide significant experiences for each class participant (ION, 2006). In designing online courses, this can best be accomplished by utilising multiple instructional strategies. Teaching models exist which apply to traditional higher education learning environments, and when designing courses for the online environment, these strategies should be adapted to the new environment (ION, 2006).

Impact of Online Learning Tools on Student Interaction and Academic Performance

Today, there are several popular learning management systems (LMS) such as WebCT and Blackboard which are commonly used by educational institutions. A review comparing these two tools suggests that Blackboard's flexible content management and group work support makes it more suitable for independent and collaborative learning (Noorminshah, Mazleena, & Oye, 2012). On the other hand, WebCT's tighter structure and fully embedded support tools makes it more appropriate for guided, less independent learning. In general, these tools are tailored more to support class activities than independent research or self-study. Online learning tools may be categorised as synchronous or asynchronous learning tools. The most common types of synchronous online learning tools in a blackboard learning management system include blackboard collaborate, video conferencing, instant messaging systems, and text-based virtual learning environments. These synchronous online learning tools promote faster problem solving, scheduling and decision making, and provide increased opportunities for educational development (Noorminshah, Mazleena, & Oye, 2012).

The most common types of asynchronous online learning tools in a blackboard learning management system include discussion forums, online assignment forums, online quizzes forum, tutor-student exchange forums, and e-tutor presentation forums. The discussion forum facilitates learner-to-learner interaction on different subject matter. Furthermore, the online assignment and quizzes forums are designed by online facilitators to assess students' performance and progress in the course. In addition, the tutor-student exchange forum facilitates learner-to-tutor interactions on different subject matter and to address any issues they may face from time to time. Finally, the e-tutor presentation forums facilitates tutors' presentations in the form of PowerPoint presentations, case studies, or video tutorial presentations on different subject matter that complements the existing course materials or clarifies any challenging areas identified by students (Noorminshah, Mazleena, & Oye, 2012). Students view the discussion forum as a means of reflection and deem it important in contributing to their success in the learning process (Menchaca, 2006; Owston, Wideman, & Murphy, 2008). Furthermore, they refer to the use of discussion forums as an interactive facility of the online learning community

where they can express their opinions, comment on their peers' postings and provide critical feedback (Menchaca, 2006; Owston, Wideman, & Murphy, 2008). While evaluating the work of their peers, the students adhere to collaborative rather than competitive positions and, therefore, they build respect for others' beliefs and develop a supportive learning community (Wang, Sierra, & Folger, 2003).

Online facilitators' knowledge and mastery of the competence in effectively using online learning tools significantly influence the perception of their instructional strategies and delivery. This has a direct impact on student interaction, learning, and academic performance. Student performance has been shown to improve slightly when students are given the opportunity to participate synchronously through videoconferencing as compared with students who used only text-based learning materials (Skylar, 2009). Higher learning outcomes have also been shown to occur when students are provided with a combination of asynchronous and synchronous forms of communication (Moallem, Pastore, & Martin, 2011). Furthermore, studies have confirmed that synchronous videoconferencing provide immediate social interaction and co-construction of knowledge while asynchronous text communication allow for reflective thinking. Online video discussions develop group cohesion and affiliation, helping students to feel a part of the group, thereby increasing engagement and participation (Pinsk et al., 2014).

Methods

Research Design

A mixed-method research approach was used to ascertain the major factors influencing the academic performance of online tertiary students in the Caribbean. Quantitative data were collected in the form of an online survey and learning style assessment, while qualitative data were collected via an online focus group discussion.

Population

The population for this study included 82 online tertiary students enrolled in the BSc. Banking and Finance programme at one of the leading provider of online tertiary education in the Caribbean. All students enrolled at this institution undergo a three-week online training workshop prior to the start of their first semester on how to manoeuvre the different functions and capabilities within the online environment. Furthermore, each student is assigned to a course delivery assistant who assists with any technical challenges or concerns they may encounter during each semester.

This online tertiary institution has approximately 50 physical locations in 17 English-speaking Caribbean countries, offering multi-mode teaching and learning services through virtual and physical locations across the Caribbean region. In addition, the institution has developed a unique approach in the Caribbean region to enhancing the student experience in innovative continuing and professional education, undergraduate, postgraduate, and continuing education study programmes and courses by distance, blended, online and face-to-face modes.

Participants

A sample population of 56 students completed the online survey administered, representing 68.3% of the total student population enrolled in the BSc. Banking and Finance programme. This sample population included students from Anguilla (3.57%), Antigua & Barbuda (3.57%), Bahamas (3.57%), Barbados (1.78%), Belize (3.57%), Dominica (3.57%), Grenada (16.09%),

Jamaica (5.36%), Montserrat (3.57%), St. Kitts & Nevis (5.36%), St. Lucia (17.85%), St. Vincent & the Grenadines (12.5%), and Trinidad & Tobago (19.64%). Seventy-nine percent (79%) of respondents were females and 21% were males. In addition, the majority of the respondents (33%) that responded to the online survey were between the ages of 26-30.

Finally, a sample of ten students enrolled in the BSc. Banking and Finance programme participated in the online focus group discussion. This sample included students from Grenada (40%), Jamaica (20%), St. Lucia (20%), St. Vincent & the Grenadines (10%), and Trinidad & Tobago (10%).

Data Collection Procedure

Online survey & learning style assessment

The online survey was distributed via email to a total of 82 online tertiary students throughout the Caribbean, with a sample of 56 students completing the survey. The online survey instrument was in two parts. The first part consisted of 25 questions that examined the extent to which the factors identified, in the focus group discussions, influenced students' academic performance. Furthermore, the online survey solicited data on students' preferred online learning tools and those that are perceived to best improve their academic performance given their respective learning styles and preferences.

The online survey consisted of closed-ended questions, open-ended questions, and questions using various points on the Likert scale. The online survey instrument was selected to collect data due to the fact that it attracts little or no cost, it facilitates automation and real-time access, and it was conveniently accessible by respondents. Responses were able to be electronically stored automatically which allows for easier and effective analysis. In addition, respondents were able to answer questions on their own schedule and pace without fear of their identities being exposed.

The second part of the survey consisted of the VARK® questionnaire, which was used to measure students' learning preferences (VARK, 2015b). A study conducted by Leite, Svinicki, and Shi (2010) justified the reliability of the VARK questionnaire. Respondents were required to complete the VARK questionnaire and post their results in the online survey instrument. This learning style assessment assisted in evaluating the notion of whether a synergy between students' learning style and a specific or a combination of specific online learning tools will reap greater results in students' academic performance.

Online focus group discussions

An invitation was sent via email to the total student population enrolled in the B.Sc. Banking and Finance programme to participate in an online focus group discussion via Blackboard Collaborate (a web conferencing tool). A sample of ten online tertiary students agreed to partake in the focus group discussions. The focus group was conducted to identify the major factors influencing their academic performance in the online environment. Furthermore, the issues relating to students' preferred online learning tools and perceptions of tutor's effective use of online learning tools were discussed. Blackboard Collaborate was selected to collect data since it provides an enhanced meeting environment with two-way voice over the Internet and instant messaging, complemented with an excellent voice recording system. This web conferencing tool was conveniently accessible by all respondents vested with the capability to connect respondents over a large geographical area.

Data Analysis

This study analysed the online learning experiences of online tertiary students within the Caribbean that have been exposed to the Blackboard Learning Management System (LMS). The data tabulation method via percent distribution was used to organize the results for the different variables in the study. This method of data analysis will allow the reader to have a comprehensive picture of what the data look like, as well as the proportions of respondents who are represented within each variable (e.g. Figure 1). The data were presented in the form of tables, bar charts, and pie charts.

In addition, the data were disaggregated across different variables which allows for deeper analysis necessary for informed recommendations and conclusions (e.g. Figure 4). Furthermore, the online chi-square calculator software was used to conduct the Pearson's chi-square statistical analysis in order to ascertain if there is a significant difference in students' preferred online learning tool based on their respective learning styles. The statistical significance of this hypothesis was determined at its p-value being less than the significance level of 0.05 (e.g. Figure 5).

For the purpose of this study, the factors identified that had a cumulative sum of at least 50% were selected for further investigation. The cumulative sums in this study were calculated by summing the percentage of students who ranked an issue as having a medium or high impact on their academic performance (e.g. Figure 1). This reflected the majority of respondents who experienced the impact of a particular issue on their academic performance at a medium or high extent.

Finally, the online learning tools under investigation that are limited to this study include the discussion forum, online assignment forum, online quizzes forum, tutor-student exchange forum, e-tutor presentation forum, and blackboard collaborate. These online learning tools were selected given that these were the most popular online learning tools used within the Blackboard Learning Management System by the student sample in this study.

Results

In the online focus group discussion, students were asked to identify the major factors influencing their academic performance in the online learning environment. The major factors identified include work responsibilities, tuition and school expenses, family responsibilities, poor lecturer/tutor teaching strategies, poor course and library resources, lack of parent/family motivational support, poor learning environment, family feuds, physical/verbal abuse, health challenges, community violence, and peer pressure. In the online survey conducted, respondents were asked to rank these factors that had a low, medium or high negative impact on their academic performance. The findings are summarised in Figure 1.

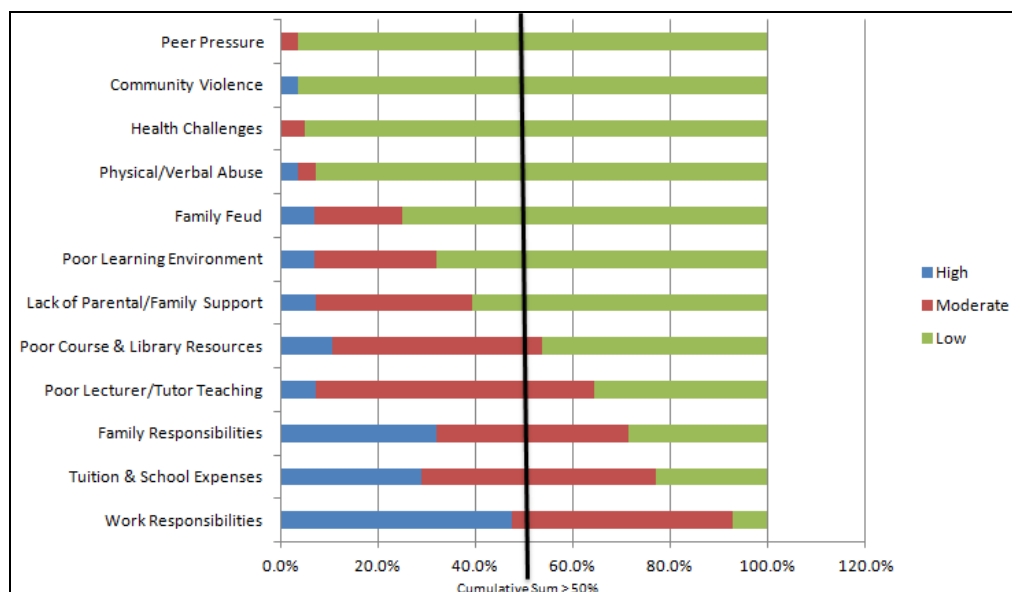


Figure 1. Major Negative Factors Influencing the Academic Performance of Online Tertiary Students in the Caribbean

For the purpose of this study, the percentage of students (cumulative sum $\geq 50\%$) who ranked an issue as having a medium or high negative impact on their academic performance were selected for further investigation. Therefore, the issues with a cumulative sum of $\geq 50\%$ include work responsibilities, tuition and school expenses, family responsibilities, poor lecturer/tutor teaching strategies, and poor course and library resources (Figure 1).

These issues were then categorised into general factors and pedagogical factors in order to present the findings in a more organised, concise and reader-friendly format. In terms of the pedagogical factors, students were asked in the online focus group discussion to identify the pedagogical issues that negatively impact their academic performance in the online learning environment. The major pedagogical factors identified include poor course and library resources, poor course structure and delivery, and tutors' ineffective use of online learning tools. The online focus group discussion revealed that tutors' ineffective use of online learning tools was the basis of poor lecturer/tutor teaching strategies and delivery. Therefore, these general factors and pedagogical factors formed the basis for further analysis in this study. The categorisation of these factors is summarised in Table 1.

Table 1

Summary of General Factors & Pedagogical Factors Influencing the Academic Performance of Online Tertiary Students in the Caribbean

General Causal Factors	Pedagogical Factors
Work Responsibilities	Poor Course and Library Resources
Tuition & School Expenses	Poor Course Structure & Delivery
Family Responsibilities	Ineffective use of Online Learning Tools

General Factors & Academic Performance

This section analysed the general factors that contribute to low academic performance in the online learning environment within the Caribbean. Furthermore, it summarised students' perceived solutions for some of the general factors identified. Based on the online survey conducted, the major general factors negatively affecting students' academic performance include work responsibilities, tuition and school expenses, and family responsibilities.

Work & family responsibilities

According to the online survey conducted, the majority of respondents (93.3%) were full-time employees. As a result, it is very important for students to balance the demands of their workplace, family, and school life. Based on the online survey conducted, respondents agreed that flexible deadlines for coursework assignments (42.9%), fewer course work assignments (23.2%), academic advisement (16.1%), and slower pace of courses (8.9%) will assist them in balancing the demands of their workplace, family, and school life. The remaining 8.9% of respondents indicated that the reduction of course content could assist in creating a balance for their respective duties. According to the online focus group discussion, respondents explained that there is too much course content to cover in a short time, as a result, most of the time is used in completing assignments rather than reading course materials.

Furthermore, discussions from the online focus group revealed the need for an increased presence of academic advisement in the online learning environment. These respondents argued that academic advisement will assist students to weigh their strengths, weaknesses, and be guided during their module selection process. Respondents strongly believe that academic advisors could assess students' readiness for the online environment and utilise different evaluation techniques to ascertain if they are mentally eligible to study online. Furthermore, respondents shared their views in the online focus group stating that academic advisors could guide students as to the potential challenges in the online learning environment and the need to be self-motivated and be independent learners, thus, reducing the occurrence of students enrolling for too many courses beyond their ability to manage given their work and family responsibilities. The perceived solutions gathered from the online survey conducted and online focus group discussion are summarised in Table 2.

Table 2

Perceived Solutions for Balancing Work & Family Responsibilities

Issue	Perceived Solutions
Work & Family Responsibilities impeding Academic Performance	Flexible Deadlines for Coursework Assignments
	Less Coursework Assignments
	Increased presence of Academic Advisement
	Slower Pace of Courses

Tuition & school expenses

High tuition and school expenses present a mental distraction to online tertiary students in the Caribbean, which negatively affects their academic performance. According to the online

survey conducted, only 41.2% of respondents were able to finance their education through salary and personal savings. Based on the online focus group discussion, some of their personal savings included borrowed funds from family and friends. The findings of the online survey revealed that the remaining 58.8% of respondents financed their education through the Government Assistance for Tuition Expenses (GATE) programme (11.8%), loans from financial institutions (29.4%), student loans (8.8%), scholarship and bursaries (5.9%) and stocks and bonds (2.9%).

Pedagogical Factors & Academic Performance

This section analysed the pedagogical factors that contribute to low academic performance in the online learning environment within the Caribbean. Furthermore, it summarised students' perceived solutions for some of the pedagogical factors identified. Based on the online survey conducted, the major pedagogical factors negatively affecting students' academic performance include poor course structure and delivery, poor course and library resources, and tutors' ineffective use of online learning tools.

Course structure and delivery

The online survey conducted revealed that among the pedagogical factors under investigation, that pertains to course structure and delivery, the stipulated deadlines for assignments, the quality of course material, and the pace of courses were rated highly as being satisfactory to very poor (cumulative sum $\geq 50\%$) in contributing to students' academic performance by majority of respondents (Figure 2). Although the timeliness of tutors' guidance and feedback was not rated satisfactory to very poor by majority of respondents, a high percentage of respondents (46.6%) rated it as such (Figure 2). Respondents, in the focus group discussion, argued that not only do they expect timely feedback, but detailed comprehensive feedback that highlights their strengths, weaknesses, and how they may improve. The findings of students' perception on the quality of these pedagogical factors are summarised in Figure 2:

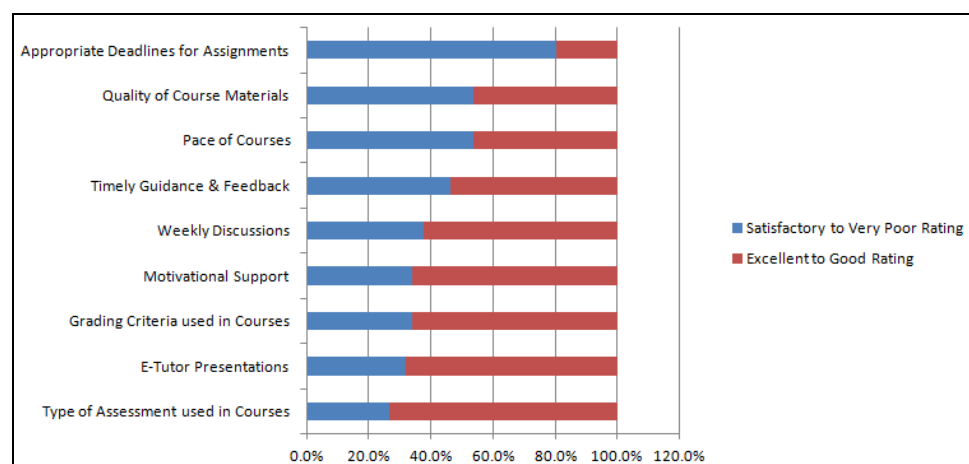


Figure 2. Students' Perception on the Quality of Pedagogical Factors in the Online Environment

According to the online survey conducted, majority of respondents (40%) indicated that courses in the online environment are at a fast pace. Furthermore, 33% of respondents indicated that the pace of courses in the online environment is at a very fast pace (Figure 3).

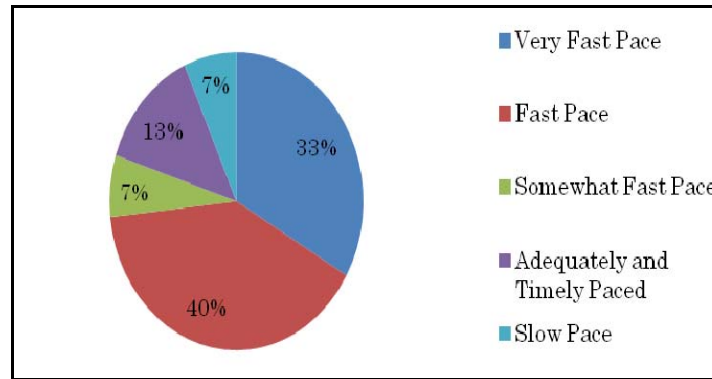


Figure 3. Students' Perception of the Pace of Courses in the Online Environment

Course & library resources

According to the focus group discussion, respondents argued that some of the course materials, though interesting, can be very bulky. As a result, more attention is placed on completing assignments rather than reading course materials because reading doesn't necessarily provide better assignment marks. In addition, respondents argued that some course materials are too general and vague and should be more reader-friendly. Furthermore, discussions from the online focus group revealed that the online library at times is difficult to use, especially when the need arises to solicit books and resource materials that are related to their course. As a result, respondents highly suggest that recommended textbooks for courses be available via the online library.

Students' preferred online learning tools

The online survey conducted revealed that a majority of respondent (46.4%) preferred Blackboard Collaborate as their most desired online learning tool. Other respondents were in favour of the discussion forum (17.9%), e-tutor presentation forum (12.5%), online assignment forum (12.5%), tutor-student exchange forum (7.1%), and online quizzes forum (3.6%) (Figure 4).

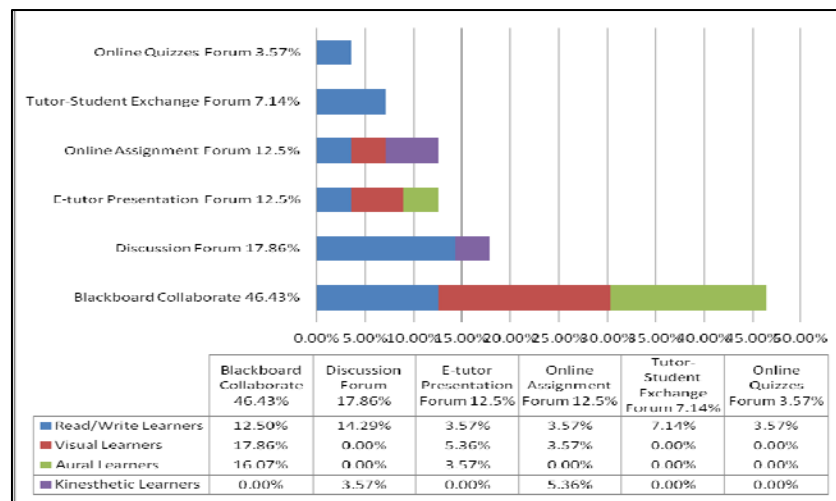


Figure 4. Students' Preferred Online Learning Tool according to their Learning Style and Preference

Students' preferred online learning tools according to learning styles

The Pearson's Chi-Square Statistical Test was used to ascertain if there was a significant difference in students' preferred online learning tool based on their respective learning styles. Based on the Pearson's chi-square-analysis in Table 1, the chi-square (X^2) of 37.499 and the degree of freedom (df) being 15 results in a p-value of 0.0011. Given that the p-value is less than the significance level of 0.05, the observed data is inconsistent with the assumption that the null hypothesis is true, thus being rejected ($p < 0.05$). Therefore, there seems to be a significant difference in students' preferred online learning tool based on their respective learning styles.

Table 1

Statistical Significance (Chi-square Test)-Influence of Learning Styles on Preferred Online Learning Tools

	Blackboard Collaborate	Discussion Forum	E-Tutor Presentation	Online Assignment Forum	Tutor-Student Exchange	Online Quizzes	
Read/Write Learners	7 11.61 (1.83)	8 4.46 (2.80)	2 3.12 (0.41)	2 3.12 (0.41)	4 1.79 (2.75)	2 0.89 (1.37)	25
Visual Learners	10 6.96 (1.32)	0 2.68 (2.68)	3 1.88 (0.68)	2 1.88 (0.01)	0 1.07 (1.07)	0 0.54 (0.54)	15
Aural Learners	9 5.11 (2.97)	0 1.96 (1.96)	2 1.38 (0.28)	0 1.38 (1.38)	0 0.79 (0.79)	0 0.39 (0.39)	11
Kinesthetic Learners	0 2.32 (2.32)	2 0.89 (1.37)	0 0.62 (0.62)	3 0.62 (9.03)	0 0.36 (0.36)	0 0.18 (0.18)	5
	26	10	7	7	4	2	56

$\chi^2 = 37.499$, $df = 15$, $\chi^2/df = 2.50$, $P(\chi^2 > 37.499) = 0.0011$

The VARK questionnaire revealed that the majority of respondents in the online environment were read/write learners (44.6%), whereby their most preferred online learning tool was the discussion forum (14.3%). Furthermore, the VARK questionnaire revealed that 26.8% of respondents were visual learners, while the remaining respondents were aural learners (19.6%) and kinesthetic learners (8.9%) respectively. According to the online survey conducted, a majority of the visual learners (17.9%) and aural learners (16.1%) preferred Blackboard Collaborate. However, the majority of the kinesthetic learners (5.4%) preferred the online assignment forum (Figure 4). Table 3 summarises these findings.

Table 3

Students' Preferred Online Learning Tool according to respective Learning Styles

Learning Style	Most Popular Preferred Online Learning Tool
Read/Write Learners	Discussion forum
Visual Learners	Blackboard Collaborate
Aural Learners	Blackboard Collaborate
Kinesthetic Learners	Online Assignment Forum

Overall, the majority of respondents across learning styles that preferred Blackboard Collaborate were visual learners (17.9%), whilst the majority of respondents that preferred the Discussion Forum were read/write learners (14.3%). Furthermore, the majority of respondents across learning styles that preferred the tutor presentation forum were visual learners (5.4%), whilst the majority of respondents across learning styles that preferred the online assignment forum were kinesthetic learners (5.4%). Finally, the majority of respondents that preferred the tutor-student exchange forum and online quizzes forum were read/write learners (7.1%, 3.6%) respectively (Figure 4). Table 4 summarizes these findings.

Table 4

Type of Learners by Online Learning Tools

Online Learning Tools	Type of Learners
Blackboard Collaborate	Visual
Discussion Forum	Read/Write
E-tutor Presentation Forum	Visual
Online Assignment Forum	Kinesthetic
Tutor-Student Exchange Forum	Read/Write
Online Quizzes Forum	Read/Write

Students' perceptions on tutors' effective use of online learning tools

According to the online survey conducted, the online learning tools that were perceived to be mostly ineffectively used were the tutor-student exchange forum, discussion forum, and Blackboard Collaborate. A high percentage of respondents rated tutors' use of these online learning tools as being satisfactory to very poor (cumulative sum $\geq 40\%$). The findings were summarised in Figure 6.

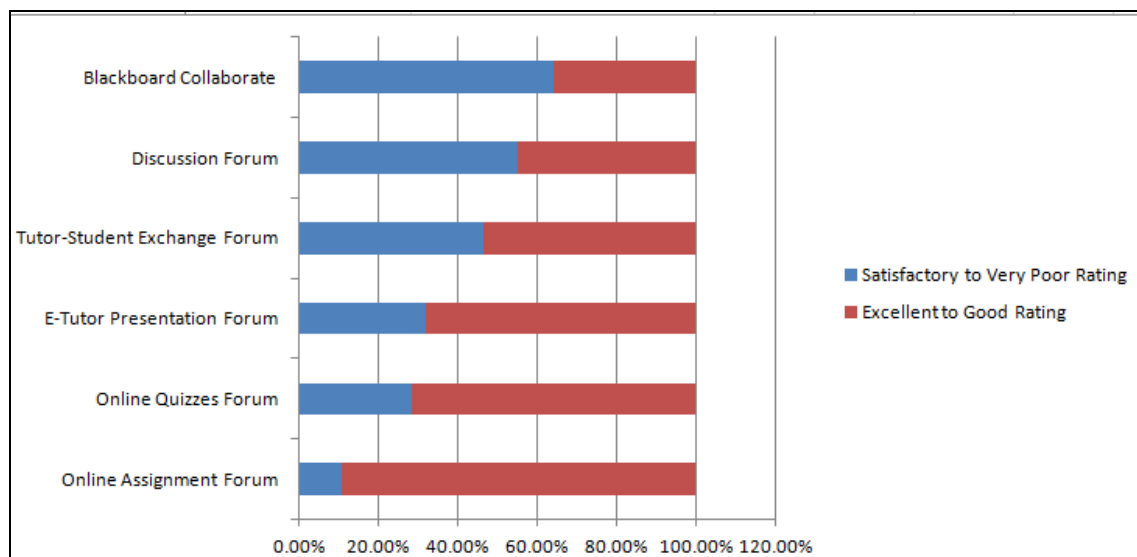


Figure 6. Students' Perception of Tutors effective use of Online Learning Tools

According to the online focus group discussion, respondents argued that online facilitators could improve the use of the tutor-student exchange forum by providing weekly reminders and guidance necessary for the successful completion of a course. In addition, respondents argued that there is room for improvement in the timeliness of tutors' feedback to students' queries and concerns. In terms of the discussion forum, participants of the online focus group suggest that tutors provide a summary or review at the end of a discussion topic and make reference to students' contribution that may be deemed vital to the overall learning process. Respondents strongly believe that this will stimulate a higher sense of motivation and interest for online tertiary students, as well as serve to clarify any uncertainty on any subject matter being discussed. Finally, respondents in the online focus group suggest that discussions on subject matter could periodically be held via live chat messaging, Skype or other social media, rather than solely in text-format in the discussion forum. Respondents strongly believe that these activities will boost students' motivation, interest, and academic performance.

According to Figure 6, it is evident that there is room for improvement in the use of Blackboard Collaborate, especially given the fact that it is the most preferred online learning tool among online tertiary students in the Caribbean (Figure 4). The discussions from the online focus group revealed that tutors should host these sessions more frequently, especially for quantitative courses. In addition, respondents argued that these sessions should not be too long given that most students normally lose interest in a session that lasts for more than one hour. According to the online focus group discussion, respondents argued that synchronous presentations via Blackboard Collaborate should engage more visual attractions and allow more time for explanation and student discussion, rather than solely a lecture most of the times. Furthermore, respondents suggest that these sessions should involve more detailed explanations of course materials and their application to real-world scenarios.

As it relates to the technical components of Blackboard Collaborate, discussions in the online focus group revealed that some tutors demonstrate little or no knowledge in maneuvering key features in the system that could stimulate a higher level of learning, student engagement, and student interaction. Some of the features include application and desktop sharing, break-out rooms, and web tours (See Figure 7).

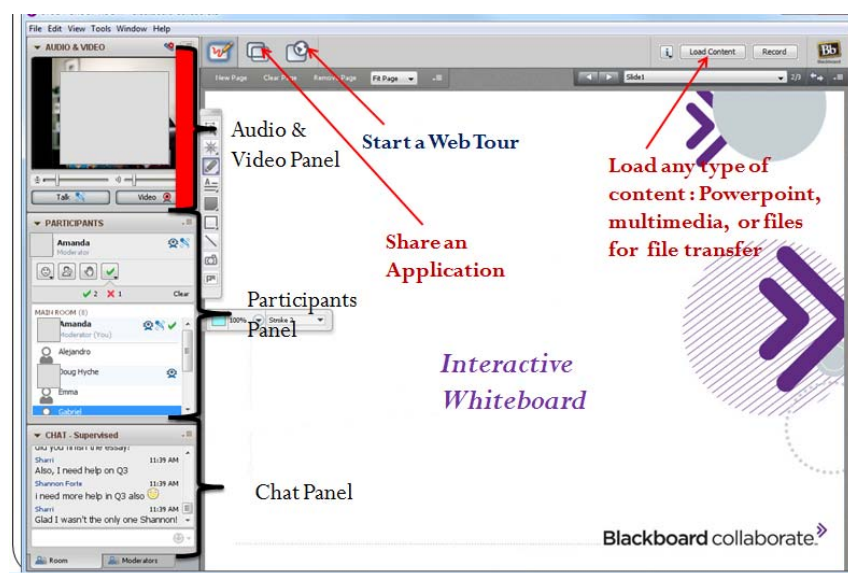


Figure 7. Ineffective use of Blackboard Collaborate Features

The application sharing feature allows tutors to share any application software (Microsoft Word, Excel etc.) with students in order to facilitate interactive learning. Respondents, in the online focus group, argued that tutors' effective use of this feature will allow them to interactively demonstrate their understanding on a subject matter and be guided where they may fall short. Break-out rooms are used to facilitate small group activities or private meetings. The break-out room is equipped with audio, whiteboard, application sharing, video, polling etc. According to discussions from the online focus group, tutors' effective use of break-out rooms will allow students to perform better when given task-based assignments. This allows for greater interactive learning among respective group members making way for a final product to be presented by the entire class. Finally, the web tour feature allows tutors to take participants to any website during the web conferencing session. Respondents, in the online focus group, explain that tutors' effective use of the web tour feature leads to another level of creativity in their presentation that will boost students' overall engagement and interactivity.

Discussion & Recommendations

Improvements to Course Development & Design

The online survey and online focus group discussion revealed the major general and pedagogical factors influencing the academic performance of online tertiary students in the Caribbean. Work and family responsibilities, as well as the mental stressors created by high tuition and school expenses were the major general factors impeding students' academic performance. The increased presence of academic advisement was perceived as a viable means of assisting students to create a balance between their work, family, and school life. This balance may afford students more time to complete course work requirements and be more involved in the learning process that will significantly improve their academic performance.

In terms of the structure of courses, the online survey revealed that the pace of courses was significantly fast for most respondents and the quality of course materials was poorly structured and organised. Furthermore, the stipulated deadlines for coursework assignments were another contributing factor impeding students' academic performance in the online learning environment. Continuous assessment of the pace of courses in any online environment is very essential in order to ensure that it does not impede the overall online learning process and experience that may negatively affect students' academic performance. In addition to courses being adequately and timely paced, deadlines for assignments should be appropriately stipulated. Effective pace of courses and appropriate deadlines for assignments will afford students sufficient time to cover both course readings and research for assignments. According to the focus group discussion, respondents argued that given the fast pace of courses, time allows for researching to complete assignments and less to reading course materials. This creates a situation where they may perform very well in coursework assignments and poorly in mid-term or final examinations. Whilst some learners may be faster than others, reasonable consideration should be given to students' respective situation that may allow them to attain their fullest potential.

Continuous review of course materials is encouraged in order to ensure that course materials stay up-to-date and are relevant to students' specific area of interest. The philosophy of "quality over quantity" must be embraced so that students may obtain the best educational experience desired. According to the focus group discussion, respondents argued that some of the course materials, though interesting, can be very bulky. Others argued that the content is too general and vague. Quality course materials will create a reader-friendly learning atmosphere

that will stimulate a greater level of critical thinking necessary for students' educational development and improved academic performance. Furthermore, students will be better equipped to contribute to online discussions and improve their performance in mid-term as well as final examinations. The focus will shift from only acquiring knowledge to the application of knowledge that is vital in developing a competent workforce.

Table 5

Summary of Improvements to Course Development & Design (corrective measures to improve academic performance and retention)

Recommendations	Implications
Increase the presence of academic advisement	Such guidance will assist students in balancing the demands of work, family and school responsibilities. This balance may afford students more time to complete course work requirements and be more involved in the learning process that will significantly improve their academic performance.
Assess and monitor the pace of courses and stipulated deadlines for assignments	This will afford students adequate time to cover both course readings and research for assignments necessary for their educational development and improved academic performance.
Continuously review the quality of course materials	This will create a reader-friendly learning atmosphere that will stimulate a greater level of critical thinking, thus, shifting the focus from only acquiring knowledge to the application of knowledge that is vital in developing a competent workforce.

Improvements to Course Delivery

In terms of course delivery, the online survey revealed that tutors could be more timely in providing feedback to students' assignments, general questions, and concerns. Respondents in the online focus group strongly believe that tutors' feedback is very critical in the learning process and may influence students' academic performance. Respondents, in the focus group discussion, argued that not only do they expect timely feedback, but detailed comprehensive feedback that highlights their strengths, weaknesses, and how they may improve. According to Butler and Winne (1995), instructor feedback intends to improve student performance via informing students how well they are doing and via directing students' learning efforts. Best practices of instructor feedback in the online environment include the simplest cognitive feedback (e.g., examination/assignment with his/her answer marked wrong), diagnostic feedback (e.g., examination/assignment with instructor comments about why the answers are correct or incorrect), prescriptive feedback (instructor feedback suggesting how the correct responses can be constructed) via replies to student e-mails, graded work with comments, online grade books, and synchronous and asynchronous commentary (Butler & Winne, 1995).

Another aspect of course delivery is tutors' effective use of online learning tools. Online learning tools are the main medium through which online facilitators demonstrate their

instructional strategies in delivering course content in the online learning environment. Therefore, online facilitators' knowledge and mastery of the competence in effectively using online learning tools creates the perceived quality of their instructional strategies and may determine the level at which they foster student interaction and learning that are critical to improving students' academic performance. The online survey revealed that Blackboard Collaborate (BbC) and the discussion forum were the most preferred online learning tools among respondents in contributing to their learning and academic performance. However, the majority of respondents perceived that these online learning tools are not being effectively used by tutors.

Respondents, in the online focus group, strongly believe that tutors' effective use of the discussion forums will stimulate a higher sense of interest in the subject matter being discussed. In addition, respondents argued that tutors effective use of BbC sessions will boost students' overall engagement and interactivity in the learning process. Overall, respondents view that BbC sessions should be more frequent, adequately timed in length, and foster more student interaction through discussion and analysis of real-world situations. Against this background, it is highly recommended that in addition to existing series of training sessions for tutors, continuous evaluation of tutors' effective use of online learning tools should be conducted and monitored, thus, addressing any weaknesses identified during the process. This may take the form of a mid-term or end-of-term tutor evaluation by students, as well as an evaluation training workshop that assesses tutors' knowledge on utilising the many features in the online learning environment. This will strengthen the confidence and competence of tutors in their course delivery and instructional strategies, thus, effectively contributing to improved levels of students' retention and academic performance.

In order to further institute corrective measures that will improve retention and academic performance, the perceptions of students' preferred online learning tools according to their respective learning style and preference were analysed. The existing literature reviewed concluded that there is a good match between students' learning preferences and instructor's teaching style that has been demonstrated to have a positive effect on students' academic performance.

Against this backdrop, online facilitators will be better equipped in the development of their instructional strategies that will cater to students' respective learning styles in the online environment. In addition, online facilitators will be in a better position to assist a student who may experience difficulty understanding a theoretical concept or a certain topic under review. Therefore, if a student faces a challenge understanding a key concept in a course, an online facilitator can instruct the student using the best-suited online learning tool according to his/her learning style. This match is highly significant in order to foster a greater level of understanding in the learning process.

Table 6

Summary of Improvements to Course Delivery (corrective measures to improve academic performance and retention)

Recommendations	Implications
Foster a culture of timely guidance and comprehensive feedback (cognitive, diagnostic, and prescriptive)	Instructor feedback intends to improve student performance and contribute to their overall educational development and experience.
Continuous evaluation of tutors' effective use of online learning tools	This will strengthen the confidence and competence of tutors in their course delivery and instructional strategies, thus, effectively contributing to improved levels of students' retention and academic performance.
Tailor instructional strategies to adopt the best suited online learning tools according to students' learning style	Applying the best suited online learning tools according to students' learning style and preferences will reap greater results in students' academic performance.

Conclusion

The recommendations embedded in this study (refer to Tables 5 and 6) will assist in improving students' learning, engagement, and interaction in the online environment, thus improving academic performance that will lead to improved levels of retention. Overall, students expect timely and comprehensive feedback, increased presence of academic advisement, concise and quality course materials, flexible deadlines for coursework assignments, and adequately-paced courses. Furthermore, online facilitators' effective use of online learning tools was perceived to be very essential in fostering learning and improved academic performance. The existing literature explains the significant impact of learning style and instructional strategies on students' academic performance. Whilst all online learning tools may positively contribute to improvements in academic performance, this study revealed that some online learning tools are more effective in reaping greater results in academic performance according to students' respective learning styles and preferences.

References

- Butler, D. L., & Winne, P. H. (1995). Feedback and self-regulated learning: A theoretical synthesis. *Review of Educational Research*, 65(3), 245–281.
- Doherty, W. (2006). An analysis of multiple factors affecting retention in web-based community college courses. *Internet and Higher Education*, 9(4), 245–255. doi: 10.1016/j.iheduc.2006.08.004
- Felder, R. M. (1993). Reaching the second tier: Learning and teaching styles in college science education. *Journal of College Science Teaching*, 23(5), 286–290.
- Felder, R., Brent, R. (2005). Understanding students' differences. *Journal of Engineering Education* 94 (1), 57–72.

- Fleming, N. (2010). *VARK classification of learning styles*. Retrieved from <http://www.vark-learn.com>
- Harb, N., & El-Shaarawi, A. (2006). *Factors affecting student performance*. Munich Personal RePEc Archive Paper No. 13621. Retrieved from <http://mpira.ub.uni-muenchen.de/13621/>
- Illinois Online Network (ION). (2006). *ION's mission*. Illinois Online Network and the Board of Trustees of the University of Illinois. Retrieved from <http://www.ion.uillinois.edu/about/mission.asp>
- Leite, W. L., Svinicki, M. & Shi, Y. (2010). *Attempted validation of the scores of the VARK: Learning styles inventory with multitrait-multimethod confirmatory factor analysis models*. *Educational and Psychological Measurement*. 70, 323-339. Retrieved from <http://epm.sagepub.com/content/70/2/323.abstract>
- Menchaca, M. (2006, July). *Identifying exceptional online learning: Optimal tools and strategies in distributed environments*. Research paper presented at the 27th National Educational Computing Conference, San Diego, CA.
- Mlambo, V. (2011). An analysis of some factors affecting student academic performance in an introductory biochemistry course at the University of the West Indies. *Caribbean Teaching Scholar*. 1(2), 79-92
- Moallem, M., Pastore, R., & Martin, M. (2011). *A comparative study on the impact of communication tools on student learning, motivation, self-regulation, and satisfaction*. In *Society for Information Technology & Teacher Education International Conference 2013* (1), 2286-2306. Retrieved from <http://www.editlib.org/p/48448/>
- Murphy, R.J., Gray, S.A., Straja, S.R., Bogert, M.C. (2004). Student learning preferences and teaching implications. *Journal of Dental Education* 68 (8), 259–266.
- Noorminshah, I., Mazleena, Salleh., & Oye, N.D. (2012). *E-Learning methodologies and tools*. *International Journal of Advanced Computer Science and Applications*, 3(2), 48-52. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.259.3524&rep=rep1&type=pdf>
- Omrod, J. E. (2008). *Educational psychology: Developing learners*. Sixth Edition. Upper Saddle River, New Jersey: Pearson Education.
- Owston, R., Wideman, H., & Murphy, J. (2008, March). *Blended learning for professional development in diverse urban settings: Findings from three project evaluations*. Paper presented at the Annual Meeting of the American Educational Research Association, New York.
- Patterson, B., & McFadden, C. (2009). Attrition in online and campus degree programs. *Online Journal of Distance Learning Administration*, 12(2), 1-11.
- Pinsk, R., Curran, M., Poirier, R., & Coulson, G. (2014). Student perceptions of the use of student-generated video in online discussions as a mechanism to establish social presence for non-traditional students: A case study. *Issues in Information Systems*, 15(1), 267-276.
- Scott, J., & Graal, M. (2007). *Student failure in first year modules in the biosciences: An interview based investigation*. Bioscience Educational e-journal 10. Retrieved from <http://www.bioscience.heacademy.ac.uk/journal/vol10/beej-10-c2.pdf>
- Skylar, A. (2009). A comparison of asynchronous online text-based lectures and synchronous interactive web conferencing lectures. *Issues in Teacher Education*, 18(2), 69-84.
- Wang, M., Sierra, C., & Folger, T. (2003). Building a dynamic online learning community among adult learners. *Education Media International*, 40(1), 49-61.

- VARK. (2015a). *Understanding how your learners learn, is your success!* Retrieved from <http://knowledgebasecentral.co.nz/TUTOR+RESOURCES/Classroom+delivery/VARK+Theory.html>
- VARK. (2015b). *The VARK questionnaire*. Retrieved from <http://vark-learn.com/the-vark-questionnaire/>
- Vorhaus, J. (2010). Learning styles in vocational education and training, In: Penelope, P., Eva, B., Barry, M. (Eds.), *International Encyclopedia of Education*, Elsevier, Oxford, 376-382.
- Wolfram (2015). *Calculating the Cumulative Sum*. Retrieved from <http://mathworld.wolfram.com/CumulativeSum.html>