Blackboard Use by Faculty Members in the Colleges of Applied Sciences in the Sultanate of Oman

Dr.Salim Abdullah Al-Naibi,
College of Applied Sciences-Nizwa,
Ministry of Higher Education,
Sultanate of Oman
Oman

Dr. Kamal Basha Madarsha,
Unit Head ICT, Department of Curriculum &Instruction
International Islamic University Malaysia
Malaysia

Dr. Nik Ahmad Ismail
Dean Kulliyyah of Education
International Islamic University Malaysia
Malaysia

Abstract

This research was conducted to investigate the use of Blackboard by faculty members in the Colleges of Applied Sciences in the Sultanate of Oman and the factors affecting their use. A questionnaire was completed online by 257faculty members representing 43.05% of the total faculty population in these colleges. Results showed that Blackboard is still underutilized by faculty; it is mainly used as a depositary tool rather than for instructional and assessment purposes. Results also revealed that there are statistically significant differences in Blackboard use related to age, experience, specialization and college. However, other demographic variables (i.e. gender and academic rank) had no effect on Blackboard usage. Technology infrastructure and faculty support were identified as being the major factors leading to limited use of Blackboard in these colleges. It is recommended that immediate action be taken to address these issues; it is further recommended that additional research be undertaken to investigate student and faculty characteristics that relate to Blackboard usage.

Keywords: Blackboard, Blackboard usage, Colleges of Applied Sciences, Faculty members,

Introduction

Learning Management Systems (LMS), or Course Management Systems (CMS), such as Blackboard, WebCT and Moodle, are innovative technological applications that support the endeavour of online learning and e-learning in higher education institutions (HEI). With their varying features as instructional tools they offer educators innovative pedagogical choices in delivering classroom content by overcoming constraints of distance and time (D'silva and Reeder, 2005).

Blackboard, as one of these applications, has many features that support teaching and learning. One of these features is its availability to both students and their instructors as it is web-based and accessed through the internet. So, instructors can upload course materials, lecture notes, quizzes, assignments, all of which students can access anytime and anywhere. Blackboard also fosters communication between students and their

instructors and between the students themselves using announcements, discussion boards, virtual classroom, blogs and email options (Bradford, et al, 2007).

In Oman, e-learning has grown rapidly since WebCT was first introduced in Sultan Qaboos University in 2001 (Al-Musawi & Abdulraheem, 2004, Al-Musawi, 2007, Weber, 2010). Later, Blackboard was introduced in the Colleges of Applied Sciences (CAS) in 2007. However, despite this rapid growth of e-learning in the country research is still not going in the same stride. Since the introduction of Blackboard in CAS in 2007, there was only one research which was conducted one year after its introduction, i.e. in 2008 and this research revealed the limited use of Blackboard by the surveyed faculty members due to lack of equipment, lack of institutional support and disbelief of ICT benefits by faculty members (Al-Senaidi, et.al, 2009). Since then no research in this area was conducted.

Therefore, this research is a part of a wider research endeavour that explores different aspects of the integration of Blackboard in CAS. Selim (2007) classified e-learning success factors into four categories: (1) Instructors, (2) students, (3) e-learning materials and course design, and (4) technology. It is stating the obvious to say that these factors are interconnected and thus one cannot discuss one aspect without touching upon the others. The current research, however, focuses on the first aspect by identifying the actual use of Blackboard by faculty members in CAS; the other aspects will be addressed when discussing the factors affecting Blackboard use from the viewpoint of the faculty members themselves. The research also explores the variation in the use of Blackboard among the research sample as a result of demographic variables, namely gender, age, teaching experience, academic rank, specialization, and the college where the faculty members are located. This research is guided by the following research questions:

1. To what extent do faculty members in the Colleges of Applied Sciences use Blackboard in their teaching?
2. Are there any effects on Blackboard use by faculty members as a result of demographic variables, namely gender, age, teaching experience, academic rank, the college, and specialization?
3. What are the perceived factors that affect faculty members' use of Blackboard?

Literature Review

In general terms, the literature shows that technology is not sufficiently integrated into HEIs with the result that these institutions may be failing to capitalize on the potential offered by the new technology. Technology infrastructure, inability of HEIs to provide support personnel and lack of interest among faculty members to embrace new technology are some of the first ranked challenges facing HEIs in this endeavour (Frimpon, 2012). Moreover, among many other categories of factors, faculty members have been identified as one of the key and crucial success factors or pillars for e-learning (Selim, 2007, Frimpon, 2012), and a major factor for the integration of information and communications technology into the learning environment (Jegede, 2008).

With reference to learning management systems, at the center of which is Blackboard, research shows that faculty uptake rates of these systems have been low (Cuneo, Campbell &Harnish, 2002, D'Silva& Reeder, 2005), and that not all functions provided by these systems are utilized. For example, Wood, et al (2004) examined the responses of 862 faculty members using Blackboard at 38 institutions in the USA and found that few faculty used Blackboard for instructional or assessment purposes, and even fewer utilized Blackboard to foster a more positive sense of community within their face-to-face classes. The primary utilization of the system by faculty was to make course documents available to students and to manage course grades. Faculty's limited experience with the system was identified as the main contributory factor to this limited use. Similarly, and looking at faculty use through the students' lens, Sutton, et al (2010) found that the biggest complaints from these students was that many faculty members did not use Blackboard. A slightly more promising finding in terms of level of Blackboard use by faculty was reported by a survey conducted in Indiana University in 2009 which showed that 72% of the faculty surveyed used Blackboard, though many others did not use any other

technology in their academic lives. However, the same study revealed that about 70% did not use plagiarism-detection software and 84% did not use blogs, and in both cases faculty claimed that they did not know that these things existed (Cunnane, 2010).Not far different from these findings, Nicholson (2014) collected feedback from instructors in Cornell University regarding their experience with Blackboard and found that 82% used Blackboard. The features that were most used by faculty were adding materials to course documents and/or content areas, along with announcements and email. The other standard features of Blackboard were underutilized such as the plagiarism detection tool, Quizzing tool, Chat and virtual collaboration tool, Wikis, blogs, and journals. Faculty claimed that they did not choose to use Blackboard because it was inadequate, clunky, cumbersome, inflexible, not user friendly, slow, difficult to navigate and difficult to understand. In the same line Taylor, et al (2010) in their recommendation report for the Michigan Technological University found that faculty believed that Blackboard had nuances that made it time consuming and that they lacked the knowledge about the support available for Blackboard, both from forums and staff. Similar observations were found in Eldridge's exploration of the faculty adoption and use of Blackboard at a community college in the Kentucky Community and Technical College System (Eldridge, 2014). It was found that the majority of users of Blackboard used syllabus, announcements, full grade center, course copy, and test and survey pool, while less than half who responded as users of Blackboard used Blackboard features that foster communication between the faculty and their students, namely discussion board, course calendar, and performance dashboard. Faculty attributed their non-use of Blackboard to the lack of seeing Blackboard, observing how to use Blackboard and not being able to properly try Blackboard. Finally, in her study of the obstacles facing faculty members in using Blackboard as a blended learning system in Saudi Arabia, El Zawaidy also found lack of needed training in using ICT as being the main obstacles. She also found that slowness of internet signal tended to interrupt faculty use (El Zawaidy, 2014).

In short, there is a consensus among researchers that Blackboard is still underutilized by instructors in HEIs and that not all the functions available in Blackboard are used. Limited experience and unfamiliarity with Blackboard, which can be linked to insufficient training and support, besides technology constraints, is one of the factors highlighted by researchers in the field. These findings arouse the interest and intention of the researcher to locate the use of Blackboard by faculty members in CAS within the context of the other HEIs. The other trigger for conducting this research, as mentioned earlier in the introduction, is the scarcity of research in this area in CAS.

Research Instrument

A questionnaire was designed to collect the data required for this research from faculty members in the six colleges. The Questionnaire consisted of three sections: the first section was designed to collect demographic information about faculty members, i.e. gender, age, academic rank, teaching experience, specialisations and the college where they were appointed. As mentioned earlier information collected by this section is used to explore the variation in Blackboard usage among faculty members as a result of these demographic variables, and thus to answer the second research question.

The second section consisted of 15 items eliciting from faculty members their reported use of different functions of Blackboard. The data obtained from these items is used to answer the first research question. In this section the participants were asked to rate their usage of each function of Blackboard using a five-point scale (1=Never, 2=Rarely, 3=Occasionally, 4=Often, 5=Always).

The third section contained 13 items relating to the possible factors that faculty members perceive as having an effect on their Blackboard usage (technology infrastructure, support and training, students and attitudes). In this section the participants were asked to give their opinions about each statement using a five-point Likert-scale (1=Strongly Disagree, 2=Disagree, 3=Neither Agree Nor Disagree, 4=Agree, 5=Strongly Agree). This section also contained an open-ended question eliciting from faculty members other possible

factors that they think hinder their use of Blackboard. The data obtained from this section is used to answer the third research question.

Research Population and Sample

The questionnaire was posted online through the Blackboard system to all faculty members in the six colleges who had Blackboard accounts in the first semester of the Academic Year 2014/2015. They were 597 faculty members in total. Two hundred and eighty three faculty members (283) attempted to complete the questionnaire. This resamples almost half (47, 4%) of the total population. However, some of the questionnaires submitted were incomplete and hence they were not included in the analysis. Moreover, 13 cases were detected to be outliers so they were removed from the dataset to reduce misleading inferences about the population. Thus, the actual sample consisted of 257 (43.05%). This sample is sufficiently representative of the total population of faculty members in the six colleges and, therefore, is enough to provide an overview about Blackboard usage in these colleges and the factors affecting faculty usage.

Data Analysis

Means and Standard Deviations were used to describe the use of Blackboard by faculty members using SPSS. Independent-Sample T-Test and One-Way ANOVA were used to test the effect of demographic variables on Blackboard usage. Frequencies and percentages were used to discuss participants' responses to the items in the third section that related to the factors affecting their use of Blackboard. In these items participants' responses were collapsed into 3 categories instead of 5 (i.e. Disagree, Neutral and Agree) so as to provide easier and clearer comparisons of responses. For the open question, content and thematic analyses were used to classify related phrases, sentences or expressions from the respondents into groups or sets of factors. Frequencies and percentages were used to describe and discuss these factors.

Results and discussion

Use of Blackboard

The means and standard deviation of the participants' responses to the questionnaire items were calculated. As the scale consisted of 5 points (1=Never, 2=Rarely, 3=Occasionally, 4=Often and 5=Always), clearly a mean score of 3 is regarded to be an average point and, thus, an occasional use of each function of the Blackboard system.

Analysis shows that the overall mean score of participants' responses is 2.44. This is below average (less than occasional use). This indicates an overall limited use of Blackboard by faculty members in CAS. Itemwise, only 4 out of 15 items have mean scores above the average point. These four items relate to using Blackboard for uploading materials (mean, 3.75), using SafeAssign to check students' work for plagiarism (mean, 3.45), settings assignments and homework (mean, 3.43), and creating and posting announcements (mean, 3.39). However, all these mean scores are still below 4 (below "Often"), meaning that these features, although used more than the other functions of Blackboard, they are not frequently used by faculty.

With regards to the use of Blackboard as an administrative tool, such as using rosters, using course calendar and using online attendance, results show that these administrative features are not utilized by faculty members, as the mean scores fall far below the occasional use (2.84, 2.13 and 2.05 respectively). Similarly, using the system for assessment purposes is still limited. On average, faculty rarely use Blackboard to create quizzes and exams (mean, 2.08) and they less than occasionally use the Gradebook to post quiz and exam

results(mean, 2.42). This reflects the tendency of faculty members to carry out these tasks on paper and through face to face interaction with their students rather than by doing them electronically.

Moreover, the results show that the communicative and interactive features of Blackboard are underutilized by faculty members. They rarely use the Blog feature (mean, 2.10) and rarely use Blackboard to send messages to their students (mean, 2.28) or post their personal information to the students (mean, 1.72). Similarly, they almost never use forums and discussion boards to encourage virtual learning as the mean scores for both these two features are below 2 (1.81 and 1.57 respectively).

To a great extent these findings are in accord with the findings of previous research which also show limited use of Blackboard by faculty members and that not all its functions are utilized (Cuneo, Campbell &Harnish, 2002, D'Silva& Reeder,2005, Wood, et al, 2004, Sutton, et al. 2010,Cunnane, 2010,Nicholson , 2014, Eldridge, 2014). Despite the variations between these studies in terms of level of Blackboard usage, it can be concluded that Blackboard is still used mainly for low-order functions; it is used as a depository medium for posting materials and announcements. Higher-order functions which support interactive teaching and learning, such as the use of blogs, discussion boards and virtual classrooms are still underutilized.

The effect of demographic variables on Blackboard usage

It was assumed that there would be some variations in Blackboard usage as a result of the differences between faculty members in terms of their gender, age, teaching experience, academic rank, college, and specialization. To test the effects of these variables in Blackboard usage, the overall mean score was used. The overall (or the average mean score) was calculated by adding up the mean score for each individual item and dividing them by the number of items yielding an overall mean score of 2.44. Independent- Samples T-Test and One-Way ANOVA were used to test the statistical significance in the variations of means.

Gender

Results presented in Table 1. below show very little difference in mean scores of male and female responses (2.51 and 2.37 respectively). Statistically, this variation is not significant (t=1.414 and *P*=.159). This can be justified by the fact that using technology in general is not gender-specific and, thus, it can be said that gender has no effect on Blackboard usage.

Table 1. Effect of gender on Blackboard usage

Gender	N	Mean	Std. Deviation	t	df	Sig. (2-tailed)
Male	179	2.513060	.7343983	1.414	252	.159
Female	75	2.375056	.6453081			

Age

Results presented in Table. 2. show that there are some variations in mean scores of different age groups. These differences are statistically significant (*F*=3.329 and *P*=.020).

Table 2. Effect of age on Blackboard usage

Age group	Mean	N	Std. Deviation	F	Sig.
30 years and less	2.298851	29	.5672604	3.329	.020
31-40 years	2.528569	114	.7556576		
41-50	2.613563	76	.6979494		
51-60	2.227402	38	.6688556		

By looking at the mean scores listed in Table 2.above, one can expect that the difference is in favour of the second category (31-40 years old) and the third category (41-50 years old) as the mean scores of the responses in these two categories are higher than the other two categories. Post Hoc Test confirms that there is a significant difference between first and third groups in favour of the latter (P= .043), and between the third and the fourth groups in favour of the former (P=.006). The difference between the second and fourth group is also significant (*P*=.024). So, it can be said that the third group (41-50 years) is the best in using Blackboard, followed by the second group (31-40 years), and thus, it can be concluded that age has an effect on Blackboard usage. This can be explained by the fact that in general terms, older people use technology less frequently than the younger generation. However, in this research, the younger generation (those less than 30 years of age) are also, surprisingly, less frequent users of Blackboard – an astonishing fact and contrary to expectation; this might be interpreted in such a way as to suggest that although the younger generations may have the competencies and confidence to use technology in general they are, nevertheless, new to Blackboard and thus may not possess the specific skills for using it in an effective way. In this context Yi & Hwang (2003) differentiates between application-specific self-efficacy and general computer self-efficacy, and that the former has more effect than the latter on users' confidence in operating the target system - in our case the Blackboard system. In this current research, this variation can be justified by the fact that most teachers in this category (i.e. 30 years of age and below) are fresh graduates and newly appointed in the colleges. Some of them may not yet have been assigned courses to teach, as the regulations in CAS suggest that newly appointed faculty members should spend the first semester having professional development training and observing other experienced faculty members in the process of teaching. It is only in the following semester that they are assigned actual teaching loads.

Teaching experience

Results presented in Table 3. show that there are some variations in mean scores of responses for different categories of teaching experience. The variation in means is statistically significant (*F*=3.832 and *P*=.010).

Table 3. Effect of teaching experience on Blackboard usage

Experience	Mean	N	Std. Deviation	F	Sig.
Ten years and less	2.287555	93	.6728170	3.832	.010
11- 20 Years	2.598611	128	.7251058		
21-30	2.607958	29	.7184646		
More than 30 Years	2.457143	7	.7101680		

By looking at the mean scores in Table 3.one can expect that the difference is in favour of the second category (11-20 years) and the third category (21-30 years) as the mean scores of the responses in these two categories are higher than the other two categories. Post Hoc Test confirms that there is a statistically significant difference between first and second groups in favour for the latter (*P*=.001). It also shows that the difference

between first and third groups is significantly in favour of the latter (*P*=.034). This indicates that faculty members with 11 to 30 years of teaching experience (the two middle categories combined) appear to use Blackboard more than both the first and the last categories, and thus it can be concluded that teaching experience has an effect on Blackboard use. To some extent this is in agreement with the findings of Eldridge's research which suggests that less experienced faculty had the greatest ratio of non-users to users of Blackboard (Eldridge, 2014).

This finding appears to be on a par with the results presented earlier regarding the effect of faculty age categories as related to Blackboard usage where it was found that young faculty members (here, less experienced) and older faculty members (here, who have more than 30 years of teaching experience) use Blackboard less than the other middle categories. It would not have been surprising if older faculty members and those with more than 30 years of teaching experience had not been prominent users of Blackboard as they were born prior to the age of the technology revolution and thus have their own teaching styles and well-developed traditional teaching methods and strategies to which they tend to cling. However, it would be less acceptable for a faculty member of around 10 years experience to be unable to embrace technology in his or her teaching - in this case Blackboard. Thus, one would expect that there are other factors affecting faculty use of Blackboard that need to be explored.

Academic rank

Results displayed in Table 4. below show that there are some variations in mean scores between Academic Ranks. From this outlook assistant lecturers and lecturers reported using Blackboard less frequently than other groups. These variations, however, are statistically insignificant (*F*=.687 and *P*=.602). Thus, we can conclude that academic rank of faculty members has no influence on their Blackboard usage.

Table 4. Effect of academic rank on Blackboard usage

Title	Mean	N	Std. Deviation	F	Sig.
Assistant Lecturer	2.448055	58	.6833702	.687	.602
Lecturer	2.431795	126	.7611290		
Assistant Professor	2.594838	66	.6488677		
Associate Professor	2.646032	6	.8718613		
Professor	2.666667	1	.		

Colleges

Results in Table 5.below show that there are some variations in mean scores between the Colleges. CAS-Ibri is the best among the colleges with a mean score of 2.69 while CAS-Sur has the lowest mean score (2.26). Although from the outlook that the variations are not that big, the differences in mean scores are statistically significant *(F*= 3.420 and *P*=.005) suggesting that Blackboard is not equally used in the six colleges. Post Hoc Test reveals that the difference between the colleges is significant and is in favour of CAS-Ibri; the differences in mean scores between CAS-Ibri and the other colleges, except CAS-Sohar are significant (*P* values range between .001 and .025); the difference in means between CAS-Ibri and CAS-Sohar was not significant (*P*=.064). However, this *P* value is not that far from 0.05. This gives us more confidence in asserting that CAS-Ibri outperforms the other five colleges in the use of Blackboard by faculty members.

Table.5. Effect of college on Blackboard usage

College	Mean	N	Std. Deviation	F	Sig.
CAS-Ibri	2.771379	66	.7156957	3.420	.005
CAS-Nizwa	2.346649	54	.6276405		
CAS-Rustaq	2.450183	39	.7093555		
CAS-Salalah	2.433333	33	.7864571		
CAS-Sohar	2.477119	28	.4960226		
CAS-Sur	2.259696	36	.8149700		

Field of Specialization

The research sample consisted of thirteen specialization groups. However, for statistical consideration, as some categories have low numbers of cases (less than five), and to create more homogenous groups, the thirteen groups were collapsed into three categories according to the nature of courses taught: (1) Faculty members teaching specialization courses (i.e. Biotechnology, Business, Communication Studies, Design, Engineering and Information Technology), (2) Faculty members teaching English courses, and (3) Faculty members teaching General Requirement courses (i.e. Islamic Culture, Arabic Skills, Math, Research Methods, History of Oman Economy, and others). The results displayed in Table 6. below show that faculty members who teach specialization courses reported that they used Blackboard more often than they did the other two groups: this gave a mean score of 2.72. The variation of means between the three categories are statistically significant (F=17.688 and P =.000), and this difference was in favour of the faculty members teaching specialization courses as Post Hoc test reveals that the difference in means between this category and the other two categories is statistically significant in both cases, *(P*= .000 and .004 respectively).

The variations of Blackboard use among different specialization groups can be explained by the fact that faculty members teaching specialization courses have at their disposal readily designed electronic materials to upload in the system - such materials as PowerPoint slides, video and audio files, as most of the course materials were imported from New Zealand as part of a memorandum of agreement between the Ministry of Higher Education in Oman and a consortium of Higher Education Institutions in New Zealand. Moreover, almost two thirds (31.3%) of the total number of participants in this category are IT faculty members and thus their experience with IT could have contributed to this difference. Contrariwise, general requirement courses are locally designed by faculty members and are all taught in Arabic except Mathematics, and course materials are not available in electronic form. Faculty members who are engaged in English language instruction, mainly teach Foundation and First Year level students; for this reason they may not, as of yet, be so well acquainted with Blackboard. To some extent this is in agreement with Eldridge's research as it also showed that those faculty relate to the category of pre-college (faculty of general requirement courses in this research) and faculty of language teachers were more non-users than users of Blackboard.

Table 6. Effect of specialisation on Blackboard usage

	N	Mean	Std. Deviation	F	Sig.
Faculty of Specialized Courses	137	2.716179	.6033694	17.688	.000
Faculty of English Courses	95	2.197928	.7079463		
Faculty of General Requirement Courses	25	2.291037	.8875829		

Factors affecting Blackboard Usage

The third section of the questionnaire included some Likert-Scale statements related to possible factors that might affect faculty use of Blackboard. This section also contained an open-ended question that elicited from faculty members other possible factors that they might think of.

The content analysis of the open-ended question yielded 4 major sets of factors that can hinder the use of Blackboard in CAS. Figure 1.shows these groups of factors and the weight of each group in relation to other groups.

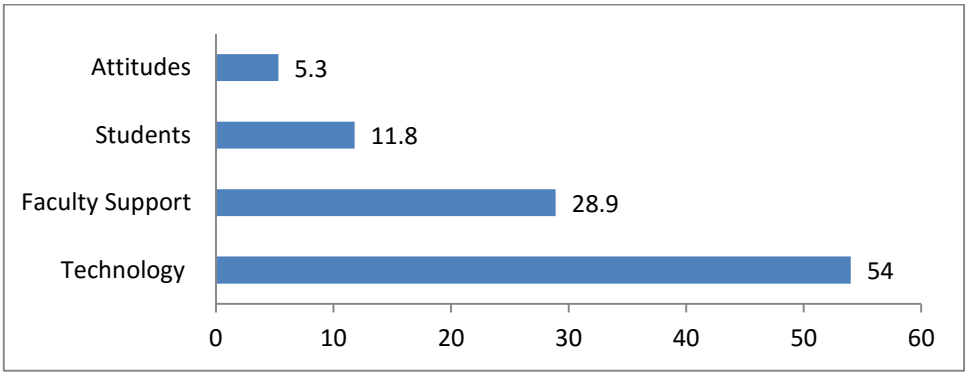

Figure 1.Factors affecting faculty use of Blackboard

Technology

It is clear from Figure 1 above that the biggest factor is technology and infrastructure. More than fifty percent (54%) of the total number of responses cluster around this category. Faculty responses indicate slow or poor internet connection and thus, limited and slow access to Blackboard. Some issues raised by the participants relate to the Blackboard Servers. They said that Blackboard was not always available due to problems with the servers. Consequently, as theorized by one of the faculty members, "*Slow speed acts as a repulsive force resulting in less use of the system*". A similar comment was raised by another participant who was trying to complete the questionnaire for this research:

> *It's taken me around 1 hour so far to complete this survey. I have difficulty getting pages to load,… the Wi-Fi goes down, the answers fail to save, the JavaScript crashes. It's been a pretty typical Blackboard experience today. If the system is unreliable I cannot plan to use it as part of my teaching. Wherever possible, I actively avoid using Blackboard as it is a frustrating waste of time. Blackboard cannot support the number of simultaneous users it experiences at times of heavy traffic.*

Another faculty said:

> *I have worked in the College of Applied Sciences for two years in both* [names of the colleges] *and have had so many difficulties accessing Blackboard that it becomes disheartening and I find myself not wanting to bother trying as I have more important tasks to do than trying to see if BB is operational. It also seems pointless to upload homework assignments and have chats, etc. on BB as the students always find that the system is down.*

Another issue that relates to this category is the functionality and shortcomings of the system. Some faculty said that it was difficult to upload large files such as video and audio files. Some faculty complained that Blackboard was very complicated and time consuming and for this reason they did not use all the features provided. Some of them said that some functions in Blackboard, such as virtual classrooms, were not operational and that SafeAssign was unreliable in detecting plagiarism. Some faculty described Blackboard as being non user-friendly, non-appealing and non-intuitive. Some of them went somewhat further and used very strong words to describe the system – these included ugly, clunky, bulky and antiquated. All this seems to have

made faculty refrain from using Blackboard - as explicitly put by one faculty "I'm completely on-board with having an electronic interface and I'm very comfortable with using such a system - just not Blackboard". Further, they thought that other technologies like Facebook, Email, Google Docs and other social media might offer better services and uses than does Blackboard.

The responses to the open-ended question were triangulated with Likert-scale items designed to determine the consistency of participants' views about resources. It was found that although almost 70% of the participants agreed that they could access Blackboard from their offices and home, and about 63% agreed that facilities to enable them to use Blackboard were adequately available in their colleges, only 44.5% believed that the system could be accessed with a satisfactory level of speed, and more than third of the participants (36.6%) did not agree with the statement. Moreover, less than third of the participants (27.2%) agreed that the Blackboard server was reliable and rarely went down, while almost half of them (46.8%) did not agree. This was consistent with their responses to whether Blackboard was always available, as almost 50 percent (48.2%) agreed that it was constantly offline. More than third of the sample (35.6%) agreed that there are systems other than Blackboard that can be easier to use, while only 6.8% did not agree and 57.6% were neutral. So, the malfunctioning and frequent interruption of Blackboard seems to have resulted in this kind of feeling which spurs faculty to seek for alternative solutions. Therefore, it is not a matter of the remote access of Blackboard from homes and offices, or the inadequacy of facilities in the colleges that prevent faculty members from using Blackboard. The problem rather lies in whether Blackboard is easily accessed with a satisfactory speed and whether it is always available and operational when needed by faculty and students. This appears not to be the case in CAS.

The comments raised by faculty in these matters were discussed with some Blackboard administrators for the purposes of further clarification. The administrators feel that one of the causes of the frustration from faculty can be attributed to the remote location of Blackboard servers outside the colleges. It should be noted here that since the CAS are all governed by a central body, the electronic systems are managed remotely from the centre where all servers for these systems and databases are stored and handled. These include the Students Information System (SIS), the Learning Management System (the Blackboard), and the Library System (Symphony). The six colleges are linked to these systems through Multiprotocol Label Switching (MPLS).

According to the administrators sometimes these servers are down and the colleges have to wait to get the problem fixed by the central Blackboard administrator who, as well as being solely responsible for the system, has many other responsibilities besides. They said these servers need to be renewed and upgraded in order to accommodate the new version of Blackboard. Connectivity with the server is sometimes interrupted by heavy traffic as many electronic systems are connected to the Ministry via one single media, i.e. MPLS. Moreover, they said that some of the features, like virtual classroom, in the new version of Blackboard, do not work; the company, which is located outside the country, has been contacted several times to fix the problem, but up to now the problem remains unsolved. They further said that some Blackboard functions may work in Firefox but not in MS Internet or Explorer, and Firefox is not installed in computer labs due to network security issues. In this case full functioning of Blackboard would not be achieved unless all computers have the operating system and the JAVA version that are compatible with the Blackboard system. Considering all these obstacles and challenges, use of Blackboard is obviously hindered.

Faculty support

It is important to distinguish between two types of support that faculty need in order to use Blackboard: technical support that addresses the technical issues such as uploading class lists onto Blackboard, updating courses offered by faculty at the beginning of each semester, fixing server problems, and acting as a help desk for faculty's technical concerns. The other kind of support is professional support which includes helping

faculty to use the different functions of Blackboard and helping them to integrate this technology into their actual teaching. These forms of support are usually effected through the medium of short courses and workshops. Results show that both types of support are not sufficiently available to faculty. According to Figure 1 above, about 26% of the reasons mentioned by participants as affecting their use of Blackboard fall into this category. Faculty members felt that "support is not up to their expectations". Unavailability of the technician when needed, delay in fixing technical issues, non-response to faculty's constant complaints, etc. were common phrases expressed by participants. Another important issue raised by faculty was inconstant updating of students and courses lists. Thus, courses remained "*piled up*" for several semesters and faculty became "*confused*" with regard to which courses were for the current semester and which were not. Likewise, faculty complained that it took too long a time for students to be included in the Blackboard system, so sometimes " *well into the semester half of the class list was not there*". In this context, I experienced the same phenomenon myself. When I designed the survey for the current research and uploaded it onto the Blackboard system and then added lists of faculty to access and complete the questionnaire, I noticed that there were more than two thousand faculty members in the system dispersed throughout the six colleges, while the actual number ought not to have exceeded 600. By going through the list I noticed there were names of faculty whose contracts with CAS had expired or been terminated 4 and 5 years previously.

With regard to professional support, faculty also complained about the infrequency of training in the use of the different functions of Blackboard. They said that if there was any training at all, it was very "*basic*". As a result many options in Blackboard were "*unexplored*", or "*unfamiliar*" to them; a typical statement in this regard reads as follows:

> *There is still inadequate teaching on the usage of Blackboard. For example, I do not know how to use" Gradbook", or how to create Course Blogs and online attendance… I also learned how to use the "SafeAssign" on my own and by my asking fellow faculty staff on how to use this system.*

The responses to the open-ended question were triangulated with Likert-scale items designed to determine the consistency of participants' views about support and training. The observation from the qualitative data appear to be consistent with other qualitative date as less than half of the participants expressed their agreement with the four statements related to training and support. In general terms, only 45.8% of the faculty surveyed agreed that training was adequate with 26.1% disagreeing. Less than half of the participants (49.2%) agreed that Blackboard system administrators conduct workshops for faculty members, while 25% disagreed. With reference to professional support provided by Blackboard administrators to faculty members, also less than half of the respondents (47.2%) agreed that this kind of support was available while 24.4% disagreed. With reference to technical support, almost a third of the research sample (30.6%) disagreed that they could get technical support easily when they needed it, but less than fifty percent (47.2%) agreed. From this perspective, in all four cases, the percentages of agreement are always higher than the percentages of disagreement. However, this level of agreement (less than fifty) points to the fact that support for faculty members in the use of Blackboard is still less than the expected level required if these colleges were to seek the integration of Blackboard into their teaching.

A note of reference should be made here which could explain the limited support provided for faculty members. When Blackboard was introduced into CAS in 2007, the support for its implementation was provided by a system support technician (called the Blackboard Administrator) one of each being allocated to each of the six colleges for the purposes of providing the required support for both students and faculty members. A central system administrator is located in the Directorate General for the Colleges of Applied Sciences to ensure the smooth running of the system in all the six colleges. However, it seems that one person is insufficient for the handling of more than 120 faculty members and more than 1500 students in each campus. Besides, these administrators are purely IT technicians and not educators. So their contributions to helping faculty members use Blackboard for teaching is quite limited as they may not be able to show faculty members real classroom

examples and experiences of how different functions of Blackboard can be used to support teaching and learning processes.

Limited support available to instructors seems to be a general phenomenon in HEIs - as confirmed by previous research. This prior research attributed limited use of Blackboard to faculty's limited experience with the system (Wood, et al, 2004), lack of institutional support (Al-Senaidi, et.al, 2009), faculty's unawareness of the existence of some functions of Blackboard (Cunnane, 2010), not observing how to use Blackboard, and not being able to practice with it (Eldridge, 2014). Moreover, inability of HEIs to provide support personnel has been one of the first ranked challenges facing HEIs in the process of integrating technology into these institutions (Frimpon, 2012).

Students

Some faculty members thought that students could be regarded as one of the factors that might contribute to the underutilization of Blackboard by faculty; 10% of the responses cluster around this theme. Again student access to Blackboard was one of the reasons mentioned, and this overlaps with the technology problem discussed above. Another reason was the students' preference to get materials from faculty on flash memory (USB) instead of getting them posted on Blackboard. Students' knowledge about Blackboard and their awareness about its importance was one of the claims from the participants that affected the use of Blackboard. This affects students' motivation and drive in using Blackboard and, in turn, this affects faculty's willingness to use the system - such as is expressed by one respondent:

> *When I taught First Year English, I used the Blackboard system more frequently to upload links and study materials; however I found that students rarely, if ever, accessed these. This disheartened me and I have rarely used it since then.*

Another faculty put it explicitly:

> *Students' motivation. I believe that with the current level of student motivation within the CAS, Blackboard is an additional requirement that sets expectations above what can be reached. I feel that by putting information in multiple places, we open up another line of excuses from students about why they have not done their work (IE- I did not see it on Blackboard). I do feel that it is important to integrate technology in the classrooms, but using it as a communication device with students seems to be ineffective. It seems more logical to keep it simple and give information in class.*

This was also measured quantitatively by two 5-point Likert scale items: (1) Students are not familiar with the Blackboard system and (2) Students are not interested in using the Blackboard system. For the first item, faculty responses were almost equally distributed between Agree, Disagree and Neutral (33.6%, 33.6% and 32.8% respectively). The large percentage of Neutral responses indicates that about a third of the participants are not aware as to whether or not their students are familiar with Blackboard, and this in turn points indirectly to the limited interaction between faculty and their students through this media. For the second statement, only 27.4 of the participants believed the students *did* show an interest in using Blackboard, while 44.8% agreed that students are not interested in using Blackboard. This is not a small percentage; it is nearly half of the research sample. So, students can be regarded as a contributory factor affecting the use of Blackboard by faculty members, and it was earlier confirmed that students are one of the success factors for e-learning (Selim, 2007). However, students' unfamiliarity with Blackboard, their lack of interest in using it, and their preference for using traditional forms of communication with their instructors can be attributed to the same factors affecting faculty's use of Blackboard discussed above - i.e. technology and support.

Faculty Attitudes

The participants in this research seem to hold reasonably positive attitudes towards Blackboard. This is clear from the result displayed in Figure 1 above; only 5.3% of the participants' responses to the open question fall in this category. Moreover, when this was measured quantitatively by a one Likert-scale statement in the questionnaire (There is no need to use the Blackboard system), 70.2% of the participants expressed their disagreement to the statement indicating that they believe in the need to use Blackboard, only 7.1% agreed and 22.6% had no opinion.

However, there were some expressions that uncovered some negative feelings towards the use of Blackboard. One faculty "yelled": *"Please stop using Blackboard. It makes the CAS college system look bad"*. Another faculty wrote that there was a *"general apathy towards Blackboard among teachers…..Most say they don't use it".* Another exemplary statement that shows negative attitudes reads as follows:

> *My Experience with this system tells me that by using this sort of system the students become lazy and crippled in the classroom. This is a redundant process which is not widely acceptable for seasoned teachers. A seasoned teacher always expects a sincere student to run after the teacher and collect the information and interact with the teacher in learning more about the subject, but this system is only taxing the good teachers who teach practically in class with in depth knowledge and discerning wisdom, but the students are encouraged to become lethargic in their responsibilities as they entertain the hope that* the *teacher updates everything on Blackboard.*

The last statement exemplifies the kind of attachment some experienced faculty members have to traditional ways of teaching. This links us back to the earlier discussion about the effect of instructors' teaching experience on the use of Blackboard where it was reported that experienced faculty members reported that they used Blackboard less than did faculty members who had less teaching experience. Although these feelings are not shared by many faculty members, as shown by this research, they indicate that beliefs and attitudes are strong contributors to the use or non-use of Blackboard. In this research, it has been found that those who hold to these traditional pedagogical values are unwilling to use Blackboard – this being corroborated by their expressed sentiments in this regard. This finding is in conformity with earlier research which found that disbelief in the benefits of ICT by faculty members in CAS, was one of the factors affecting their use of Blackboard (Al-Senaidi, et.al, 2009). It is also in agreement with what has been already established, which is, that the characteristics of faculty members, including knowledge and attitudes, are among the pillars and success factors for e-learning (Selim, 2007, Frimpon, 2012).

Conclusion

This research was launched to explore the use of Blackboard by faculty members in the Colleges of Applied Sciences in Oman and the factors affecting their use. The findings indicate that Blackboard is still underutilized by faculty members. It is still not used for instructional and assessment purposes, but rather, is mainly used as a depository tool to upload course materials, assignments and announcements. High-order functions of Blackboard such as Blog, discussion boards and virtual classroom are rarely used. Demographic variables of Gender and Academic Rank have no effect on faculty use of Blackboard. However, age, teaching experience, specialisation and college, contribute to statistically significant variations in the mean scores of the participants' responses, suggesting that Blackboard use differs between faculty members as a result of these demographic variables.

The research has identified technology resources and infrastructure as being the major factors leading to the limited use of Blackboard by faculty members in CAS. The other major constraint is the limited support and training for faculty members, the kind of support that would enable them to integrate this tool in their teaching.

The participants in this research also claim that students are one of the factors standing against their utilization of the system. Obviously this is an acceptable conclusion given that when students are unwilling to use Blackboard, or if they prefer to use other forms of communication between themselves and their instructors, instructors will have neither the impetus nor the encouragement to make use of it. However, it has been argued that students' characteristics (willingness, preference, interests, and familiarity) could be a result of the same factors affecting faculty use of Blackboard, i.e. technology and support issues. Research also reveals that limited use of Blackboard is due to faculty's negative attitudes toward Blackboard, although these feelings are not shared by many faculty members as the majority believes in the need to use Blackboard. Again the frustration and negative feelings manifested by faculty members can be attributed to the effect of technological constraints and limited support and training.

The Colleges of Applied Sciences have to address the issues of technology and support in order for faculty members and students to reap the advantages and potentials of Blackboard in their teaching and learning, because with the current situation it would not be expected that faculty members or their students would be able to use Blackboard effectively. Other factors, i.e. students' and faculty's attitudes, need not to be ignored. Thus, further research is recommended to explore the characteristics of students and faculty members and the relationship between these characteristics and the use of Blackboard.

References

Al-Musawi, A. & Abdelraheem, A. (2004). E-learning at Sultan Qaboos University: status and future. *British Journal of Educational Technology* 35 (3), 363–367.

Al-Musawi, A. (2007). Current status of educational technologies at Omani higher education institutions and their future prospective. *Educational Technology Research and Development* 55 (4), 395–411.

Al-Senaidi, S., Lin. L, & Poirot, J. (2009). Barriers to adopting technology for teaching and learning in Oman. Computers & Education 53 (3), 575–590.

Bradford, P., Porciello, M., Balkon , N., & Backus, D. (2007). The Blackboard Learning System. *The Journal of Educational Technology Systems* 35, 301-314. URL: http://www.gilfuseducationgroup.com/wp-content/uploads/2009/08/learning-management-system-Blackboard.pdf . Accessed on 12/01/2015.

Cuneo, C., Campbell, B. & Harnish, D. (2002, April). The integration and effectiveness of ICTs in Canadian postsecondary education. Paper presented at *the 2002 Pan-Canadian Education Research Agenda Symposium,* Montreal, Quebec. URL: http://www.cesc.ca/pceradocs/2002/papers/CCuneo_OEN.pdf . Accessed on 09/01/2015.

Cunnane, S. (2010, August 12). Students 'let down' by the academic luddites. *Times Higher Education*. URL: http://www.timeshighereducation.co.uk/412958.article. Accessed on 11/03/2015.

D'Silva, R., & Reeder, K. (2005). Factors that influence faculty members' uptake and continued use of course management systems. *British Journal of Educational Technology*, 36(6), 1071-1073.

El Zawaidy, H. (2014). Using Blackboard in online learning at Saudi universities: faculty member's perceptions and existing obstacles. *International Interdisciplinary Journal of Education,* 3(7), 141-150.

Eldridge, B. (2014). *Exploring faculty adoption and utilization of Blackboard at a community college in the Kentucky Community and Technical College System*. Theses and Dissertations-- Educational Policy Studies and Evaluation. Paper 24. URL: http://www.cluteinstitute.com/ojs/index.php/TLC/article/viewFile/1132/1116. Accessed on 11/03/2015.

Frimpon, F. (2012). Re-structuring of the critical success factors for e-learning deployment. *American International Journal of Contemporary Research*, 2 (3), 115-127.

Jegede, P. (2008). ICT attitudinal characteristics and use level of Nigerian teachers. *Issues in Information Science and Information Technology*, 5, 261-266.

Nicholson, K., Tokman, M., & Maniscalco , T. (2014). *Faculty Feedback on Blackboard Course Management System*. URL: http://acadtech.cit.cornell.edu/files/2014/08/FacultyBbFinalReport-17zixco.pdf. Accessed on 12/03/2015.

Selim, H. (2007). Critical success factors for e-learning acceptance: confirmatory factor models. *Computers & Education*, 49, 396-413.

Sutton, S., McCoy, S. & Pfaffman, J. (2010). Effective uses for Blackboard: Do students and faculty have a shared vision for how Blackboard should be used to support instruction? In D. Gibson & B. Dodge (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2010*, 3361-3366. Chesapeake, VA: Association for the Advancement of Computing in Education (AACE).

Taylor, G. Maynard, L., Askwig, J., & Heikkinen, N. (2010). *Making Blackboard accessible to Students, Faculty, and Staff Campus-wide*. URL:http://www.hu.mtu.edu/~ncheikki/pdffiles/RecommendationReport.pdf. Accessed On 09/01/2015

Weber, A. (2010). *Web-Based Learning in Qatar and the GCC States*. Center for International and Regional Studies, Georgetown University School of Foreign Service in Qatar. Occasional Paper No. 5.

Wood, R., Baker, J., & Hopper, D. (2004). Hybrid structures: Faculty use and perception of web-based courseware as a supplement to face-to-face instruction. *The Internet and Higher Education*, 7(4), 4th Quarter 2004, 281–297.

Yi, M. & Hwang, Y. (2003). Predicting the use of web-based information systems: self-efficacy, enjoyment, learning good orientation, and technology acceptance model. *International Journal of Human-Computer Studies*, 59, 431-449.