The Adoption of Google Classroom at the Catholic University of Zimbabwe

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Abstract

E-learning platforms are becoming a more popular learning approach in the higher education sector because of the rapid growth in internet technologies in Zimbabwe. It has been integrated in most Zimbabwe university programs including the Catholic University of Zimbabwe which has adopted the Google Classroom platform. The technology acceptance model (TAM) is used to assess the adoption of the Google Classroom by lecturers at its campuses. The TAM model proposes the perceived usefulness and perceived ease of use to predict an application usage. The survey and observation methods were used in the study. This study's contribution is three-fold. Firstly, it assesses whether lecturers are receptive to the Google Classroom in this institution. Secondly, it seeks to determine factors that influence the adoption of the Google Classroom as an e-learning platform. Thirdly, as far as we know, the study is among the first to assess the Google Classroom using the technology acceptance model. It is recommended that there should be increased usage of this technology to assess technology based initiatives.

Keywords: technology acceptance model, perceived ease of use, perceived usefulness, attitude towards use, behavioural intention to use

Introduction

A good number of private and public institutions are using e-learning methods to support their full-time on-campus learners or to offer academic programs via distance learning (OUM, 2004). Learners can now use information communication technology (ICT) to receive assessments and class notes and even communicate with one another.

Many definitions of e-learning exist but in this study it is defined as learning that makes the use of ICTs to support student teaching (Jenkins & Hanson, 2003). E-learning is based on the

ICTs using the internet though not limited to it. Based on the internet, e-learning platforms are becoming diverse with the Google Classroom being one of the latest in this technology. In addition, e-learning offers opportunities for interactivity between students and their lecturers during content delivery efforts (Wagner *et al,* 2008). As more and more blended course delivery initiatives take shape, a significant portion of traditional class-time teaching is replaced more and more by online technology (OIT, 2009). The Google Classroom has become one of the most recent technologies based on the internet.

With the Google Classroom developments taking shape, factors that determine acceptance and use of Google Classroom technology should be studied in order to further assist development of this e-learning technology. An e-learning initiative requires an effective implementation that takes into account a number of issues including individual, environmental and technological factors. The effective use of e-learning based technology in delivering a course is of critical importance to the acceptance of an e-learning platform by all stakeholders. In this paper, TAM is used to study the effectiveness and acceptance of the Google Classroom technology.

Research objectives

Firstly, this study assesses whether lecturers are receptive to the Google Classroom at the Catholic University of Zimbabwe. Secondly, the study seeks to determine factors that influence the adoption of the Google Classroom as an e-learning platform. Thirdly, it seeks to assess the Google Classroom using the technology acceptance model and suggest solutions to increase use of this technology.

Problem statement

This study aims to find out whether the Google Classroom is acceptable or not as an e-learning platform by university lecturers at the Catholic University of Zimbabwe. In addition, it seeks to find out whether the attitudinal beliefs of perceived usefulness and perceived ease of use are

related to the Google Classroom adoption. With the rapid development of the Web technologies today, we see e-learning evolving to become a new e-learning version 2.0, where the focus is more towards a personal learning environment and the practice of self-regulated learning at own time (Jennifer, 2013).

Theoretical background

The TAM model is used to predict the effectiveness of technology usage. Davis (1989) created the technology acceptance (TAM) model for this purpose. His ideas were borrowed from the theory of reasoned action (TRA) developed by Fishbein and Ajzen (1975). TAM proposes that perceived usefulness (PU) and perceived ease of use (PEOU) determine an individual's intention to use a technology. PEOU was as well considered to have an influence on PU of a technology. Figure 1 depicts the original version of the TAM by Davis (1989).

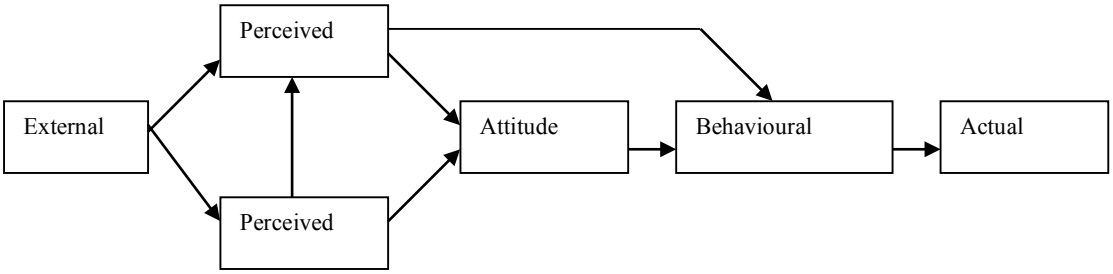

Figure 1: The Original Technology Acceptance Model.

According to Chutter (2009), TAM, originally developed by Davis et al. (1989) to predict computer usage behaviour, emerged as the most powerful model for this purpose. TAM aims to offer an explanation of the determining factors of technology acceptance that help to explain a broad range of end user computing technologies and user group systems. Early studies used simple measures of PU and PEOU taken after a very brief period of interaction with the system to predict and explain future technology user behaviour. The same is applicable to this study since the respondents had a brief interaction with the Google Classroom in this setting.

Many studies have used students to study the TAM model to test it. Lee et al. (2003) reported that many studies on TAM made use of students specifically in controlled environments. The results collected from the studies cannot be applied in general terms to the real world, except a few that considered systems that are of specific mandatory use (Yousafzai et al., 2007; Chuttur, 2009). This study sought to make a difference in a real world setting by making use of lecturers as respondents in order to draw conclusions on TAM applications on Google Classroom.

Methodology

The observation and survey methods were used in this study. An observation of 8 classes with about 157 students over a period of 4 months was done on the operation of the Google Classroom at the university. The information was recorded on a daily basis depending on the reports and records of communication among students and lecturers. The observation gave information on indications of the influence, issues and difficulties in the university that may be causing present and future problems. A questionnaire survey was conducted at Catholic University of Zimbabwe (CUZ) to evaluate the application of TAM technology by lecturers, as implementers of the Google Classroom, in all of the university campuses that are connected to the internet. CUZ started implementing Google Classroom in January 2016. The aim is to assist the university in all faculties in the delivery of course materials to students. Using this platform, lecturers are able to post course outlines, assignments, lecture notes and make announcements on the Google Classroom for the benefit of their students. Access to class is restricted to students only enrolled in that course who are given the class code, quite similar to how an intranet network works.

The respondents for the study were drawn from among all lecturers (N=37) using the Google Classroom technology in their courses. Every respondent in the study was asked to fill out a 21 question questionnaire indicating one's agreement or disagreement with each statement on a 5-point Likert-type scale with the end points being "strongly disagree" and "strongly agree".

Scale items in this survey were adapted from scales measuring variables as in Davis, Bagozzi & Warshaw (1989).

Out of the 21 questions, the last 4 questions where designed to collect demographic data in respect of gender, age and faculty. The information is important for purposes of control in data analysis. Responses were collected from a sample of 37 lecturers out of population of 58, giving a response rate of around 63% (N=37). However, 3 responses were discarded due to incomplete information, leaving 34 usable responses. Descriptive statistics collected from the survey showed the majority responded since some campuses were not yet connected to the internet. SPSS version 21 was used to compute the descriptive statistics to determine the characteristics of the responses. In answering the main research question and to test the hypothesis, we performed a reliability analysis, internal consistency check and correlation analysis.

The findings are as follows: The respondents were (19/56%) males and the (15/44%) females. The majority of lecturers were in the 36-45 age groups.

Figure 2 presents the original TAM version by Davis (1989) which was used to assess user acceptance of the Google Classroom technology.

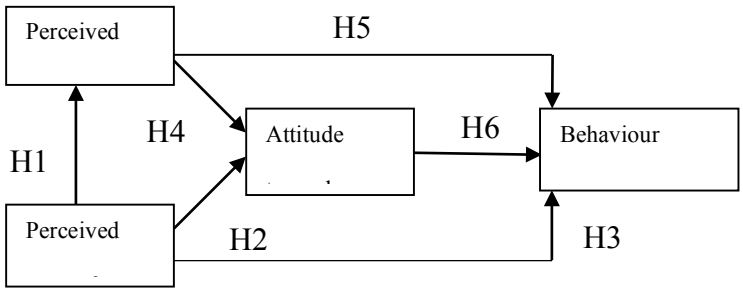

Figure 2. The TAM research model for adoption of the Google Classroom.

The following research hypotheses used are based on the TAM model above:

H1: Perceived ease of use has a significant effect on the perceived usefulness of the system.

H2: Perceived ease of use has a significant effect on attitude towards using.

H3: Perceived ease of use has a significant effect on behavioural intention to use.
H4: Perceived usefulness has a significant effect on attitude towards using.
H5: Perceived usefulness has a significant effect on behavioural intention to use.
H6: Attitude towards using has a significant effect on behavioural intention to use.

Results analysis

Data recorded form observation of classes was categorised into challenges and benefits of using the Google Classroom in order to be meaningful. For survey data testing the reliability of all measurements in the TAM model, the Cronbach Alpha reliability coefficients for the constructs was calculated as depicted in Table 1.

Table 1

Cronbach Alpha Coefficients

Construct	**Cronbach alpha**
Perceived usefulness	0.901
Perceived ease-of-use	0.905
Attitude towards use	0.832
Behavioural intention to use	0.864

The reliability measures are above 0.70 the recommended minimum level and the upper desirable level of 0.80 for social science research. Therefore, all scales are reliable and have high internal consistency.

Table 2 below show the correlation analysis results observed. Pearson correlation (r) is used to measure the strength of a linear association between variables n and m.

Table 2

Correlations of Constructs

Constructs	**Perceived Usefulness**	**Perceived Ease of Use**	**Attitude toward s use**	**Behavioural intention to use**
Perceived Usefulness	1.000	0.462	0.524	0.622
Perceived Ease of Use	0.462	1.000	0.325	0.272
Attitude towards use	0.524	0.325	1.000	0.510
Behavioural intention to use	0.622	0.272	0.510	1.000

Figure 3 also shows the results and the associated r and ρ - values in accordance with the TAM research model, which are both positive.

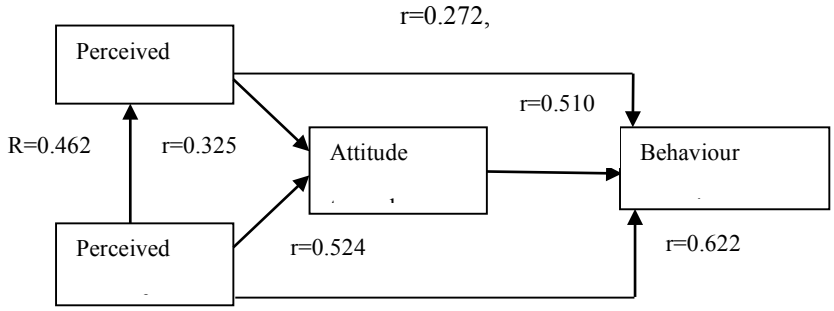

Figure 3: Research Model with Correlations

In Table 3 below, the findings are summarised in accordance with the research hypotheses resulting from the TAM analysis above. According to the results in Table 3, all six hypotheses are supported, which provides strong evidence that Google Classroom supports effectively the learning process at the Catholic University of Zimbabwe as a technology. Google Classroom can complement existing traditional old methods of teaching and learning, which tend to be time consuming.

Table 3

Research Hypotheses

Hypothesis		Support
H1	Perceived ease of use has a significant effect on perceived usefulness	Yes
H2	Perceived ease of use has a significant effect on attitude towards use	Yes
H3	Perceived ease of use has a significant effect on behavioural intention to use	Yes
H4	Perceived usefulness has a significant effect on behavioural intention to use	Yes
H5	Perceived usefulness has a significant effect on attitude towards use	Yes
H6	Behavioural intention has a significant effect on attitude towards use	Yes

The results in general show acceptance of Google Classroom by lecturers as a means of reaching out to students, and distribution of notes and assignments.

On the other hand, observation results from Google Classrooms on student daily activities showed that students were accessing the Google Classroom either for notes, assignments and communication. They posted comments sharing information among themselves and, in some cases, with their lecturers. Another important observation is that not all students have access to

computers and personal laptops to access the Google Classroom. The challenge is how to make computers accessible to all students when they are on other university campuses.

The valid results of the challenges encountered by lecturers in using the Google Classroom are summarised in Table 4.

Table 4

Challenges and Possible Solution when Using Google Classroom

Challenges	**Frequency**	**Percent**	**Valid Percent**	**Cumulative Percent**
Not trained	4	12.12	12.12	12.12
No internet connection	5	15.15	15.15	27.27
Struggling to register	5	15.15	15.15	42.42
Not user friendly	2	6.06	6.06	48.48
Internet connectivity problems/usually internet is down or slow	17	51.52	51.52	100

The analysis shows that the predominant challenges lecturers find are the internet connectivity resulting in users struggling to register and lack of proper training. Results from observation also found the same problems mentioned in Table 4 are encountered by students with internet connectivity being the major problem. Students complained about the slow internet connection, especially during school hours when all students are on campus.

Table 5 summarised the perceived benefits of using the Google Classroom in this setting.

Table 5

Benefits of Using the Google Classroom

Benefits	**Frequency**	**Percent**	**Valid Percent**	**Cumulative Percent**
Information dissemination and interaction	8	25.81	25.81	25.81
Information is accessible by many	5	16.13	16.13	41.94
Learning anywhere anytime	4	12.90	12.90	54.84
Cost effective	2	6..45	6..45	60.29
Saves time	5	16.13	16.13	76.32
Sending notes and assignments	5	16.13	16.13	92.45
Sharing ideas with student and lecturers	2	6.45	6.45	100

The analysis shows that dominant benefits are information dissemination and interaction, sending notes and assignments, time saving and accessibility of information. The same benefits were observed in the classes observed. All respondents reference information dissemination and interaction as benefits achieved by using the Google Classroom. However, given those benefits, the major observation is that students struggled to get internet access on campus compared to their lecturers who use different access points when they are in their offices.

Discussion

The study findings presented here were guided by two main questions: What perceptions influence a lecturer's adoption of the Google Classroom at university? Does the attitudinal

beliefs of perceived usefulness and perceived ease of use have a relationship towards adoption of the Google Classroom?

To answer these research questions, this study applied TAM to investigate the conditions affecting lecturers' acceptance of a Google Classroom as an e-learning technology. The absence of a conceptual framework in some prior studies that dealt with the effectiveness of e-learning technologies resulted in partial inconsistent results, thus, the question what constitutes universal determinants in effective delivery of e-learning remained unanswered.

However, in this study, research findings clearly showed that, at an individual level, lecturers and students agree that Google Classroom is an acceptable e-learning platform. The findings suggest that the Google Classroom enhances effective teaching and increases lecturer productivity at individual level. The same can be said at student learning level. When the unit of analysis is an individual, the focus is one of technology acceptance (Dasgupta, Granger & Mcgarry, 2002).

At organisational level, the research findings showed that most lecturers and classes observed accepted the introduction of the Google Classroom as an e-learning platform despite access problems. This means students would easily access information posted by lecturers. The findings also show that on their part, lecturers have accepted and do make use of the Google Classroom e-learning platform. In the light of the above, training of lecturers can be pivotal in further directing their perceptions towards the usefulness of this technology.

Great flexibility is offered by e-learning systems (Kocur & Kosc, 2009). This flexibility is provided by the several forms by which the learning material is presented in Google Classroom. It gives students the means to learn in their own time and at their own pace as information becomes available. It means the Google Classroom makes available content for re-use when needed. Kwofie and Henten (2011) highlighted that e-learning can provide more ways in which

students can develop educationally. A wide range of students with no or little experience in formal education can make use of the opportunities afforded by the Google Classroom technologies as well.

Andersson and Grönlund (2009) believe that e-learning solutions have the potential to reduce costs, widen access and to improve the quality of education in Africa. In adopting the Google Classroom, the Catholic University of Zimbabwe believes in the benefits of e-learning. In line with these benefits, most learning institutions in the region have been spending a lot of money to implement and pilot various e-learning solutions (Farrell & Isaacs, 2007). Unwin et al. (2010) believe that e-learning platforms also help institutions to meet demands of a growing student population through technology-enhancement and complementing existing traditional face-to-face delivery systems. We can also see this trend growing in Zimbabwean higher learning institutions, including the Catholic University of Zimbabwe.

The benefits of the Google Classroom are several and lecturers believe that adoption of this e-learning system facilitates teaching and learning through information dissemination and interactive learning. However, each organisation has its own unique challenges. Technological challenges met by lecturers and students can be addressed by interventions such as installing reliable internet connectivity and training of lecturers in Google Classroom technologies.

Conclusions and recommendations

Several conclusions are drawn from research findings of the study.

First, was the use of a model, TAM, in an educational setting, which was a marked difference from the business information system organizations frequently studied by many researchers in ICT. At a managerial level, the findings can reveal that, in order to encourage an individual's intention to use a technology, there is need to first develop the individual's positive perception of the technology's usefulness. Equally important was the lecturers' attitude towards using

technology which would in turn influence students' attitude. Provision of training and information sessions in the Google Classroom technology should focus primarily on how such technology can assist and improve the effectiveness of the learning process.

In summary, TAM, however, is not necessarily a descriptive model because it does not provide for diagnostic capability of specific flaws in technology under use just as the observation results have shown. TAM can only serve the purpose of predicting and evaluating technology acceptability in a setting. The authors expanded this validity of the findings of TAM to address the challenges on lecturer and student limitations to fully embrace the Google Classroom in this setting. The research findings on the challenges encountered are slow internet connection resulting in difficulties in registering and accessing learning materials.

Another challenge is lack of proper training and accessibility. The solution is to increase the bandwidth and training lecturers and students in the use of Google Classroom technologies. Most lecturers and students, as observed, agree that the benefits of information dissemination, sending and receiving notes and assignments and communication are mutually inclusive of both parties . We recommend that there should be further investigation using the technology acceptance model (TAM) to assess students' adoption of the Google Classroom at university campuses and confirm whether students as primary respondents to the sequel study hold views similar to the views of their lecturers.

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