Understanding Factors Influencing Infusion and Use of an Online Collaboration Tool: A Case of a Higher Education Institution in Lesotho

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Abstract. It is imperative for organisations adopting new technologies to investigate factors that may encourage or discourage users from using such technologies in the initial stages of adoption. This may help in identifying, among others, training needs to focus on in further encouraging users to continue to use the technology. This study investigated the above phenomenon by specifically focusing on the Online Collaboration Tool (OCT) at a higher education institution in Lesotho. The study followed a quantitative approach where data was collected from a sample of 216 respondents through a questionnaire. The data was analysed using the Statistical Package for the Social Sciences (SPSS). Theoretically grounded on the Unified Theory of Acceptance and Use of Technology model, the study found that performance expectancy and effort expectancy positively influence the behavioural intention of students to use the online collaborative tool (OCT); while social influence, facilitating conditions and behavioural intention do not have a significant influence on the students' behaviour to use OCT. The results suggest that students actually use technology irrespective of whether they think they will learn or not learn from using it.

Keywords: Online Collaboration Tool · Infusion of technology · Unified Theory of Acceptance and Use of Technology · Technology acceptance models · Higher education institutions · Technology adoption · Learning management systems

1 Introduction

Information and Communications Technology (ICT) has become an integral and accepted part of people's daily lives [36, 40]). As such it may not be surprising that some members of the millennial generation and most members of generation Z are almost always busy with their technological gadgets - at work, home, school, play, on the go and when they go to sleep [26]. Seamlessly, the use of technology helps both profit-making and non-profit making organisations in running their operations [2]. The profit making organisations benefit in that through using these innovations, they are able

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O. Gervasi et al. (Eds.): ICCSA 2021, LNCS 12950, pp. 443–458, 2021.
https://doi.org/10.1007/978-3-030-86960-1_31

to conduct business transactions irrespective of time and location (*e.g., e-commerce, m-commerce and e-procurement*) [34], hence, maximising profits. The latter organisations benefit in such that they are able to expedite service delivery, hence, satisfying customers [23].

Higher educational institutions are not an exception to using technology. As an example, South African institutions of higher learning such as University of Cape Town (UCT), University of Kwazulu Natal (UKZN) and University of the Free State (UFS) have the online application facility for new and returning students. Furthermore, UCT uses an online collaboration and learning environment named Vula [7]. This environment is used to support UCT courses as well as other UCT-related groups and communities. The UFS uses a learning management system called Blackboard [8]. However, one higher education institution in Lesotho had been lagging behind its counterparts in either using the collaborative environment or learning management systems. It was only at the beginning of the academic year 2014/5 that this institution, for the first time in its lifetime, acquired an Online Collaboration Tool (OCT).

According to the developers of OCT [31], it offers a rich set of collaboration features to enable secure communication and sharing of resources within the community of the institution. It also helps students and educators to form an efficient online teaching and learning ecosystem where course resources can be shared and accessed conveniently. OCT extends beyond course management by providing a comprehensive collaborative environment that can facilitate collaboration between researchers sharing similar research interests and staff members within non-academic units working toward common goals. Finally, OCT purportedly enhances productivity by enabling personnel to locate and view information related to their roles and responsibilities faster and easily. According to Franzoni et al. [17], systems similar to OCT should also allow educators to track how frequent students utilise them, as well as, to check the activities that students perform on those systems. In this way, educators are able to continuously monitor the learners.

What obtains in practice is sometimes not always what was planned. Several benefits, though limited, have been reported since the inception of the tool usage. These benefits can be classified into fast and easy communication, sharing of resources and cost cutting measures. In relation to communication, students are able to communicate (*email and/or chat*) with their educators and vice versa; employees are able to communicate among themselves; and administrative offices are able to make announcements (*e.g., invitations to seminars, meetings or conferences, notifications of new appointments, etc.)* through OCT. In relation to sharing resources, educators are able to upload course materials (*e.g., course outlines, spreadsheets for student marks, lecture notes, etc.*) on OCT and students access them from there; and administrative offices are able to share necessary documents with the community of the institution through uploading them on OCT (*e.g., strategic plan, almanac of events, lecture time table, notices, etc.).* According to Moteete (personal communication, 16 September 2015), massive printing of documents had reduced because prior to using OCT, every message that was meant for consumption of the community of the institution, had to be printed and posted on the notice boards. She further indicated that it was even worse that such wasted paper is not even recycled as there is not such a service at the institution.

As a way to integrate OCT with Integrated Tertiary Software (ITS) – a corporate Computer Information System used for administrative functions at the selected institution of higher education in Lesotho, [31] had proposed loose coupling. In defining and creating this integration, they had proposed to use the Simple Object Access Protocol (SOAP) (see Fig. 1). However, during the first year of adoption of OCT, the intended integration had not happened (see a dashed line labelled "not implemented?" in Fig. 1). The implication was that, for OCT to be updated with data (*for example, details of student registration*), the OCT team had to be given data retrieved from ITS on an external storage (*physically*). As a result, that caused a lot of inconvenience to users.

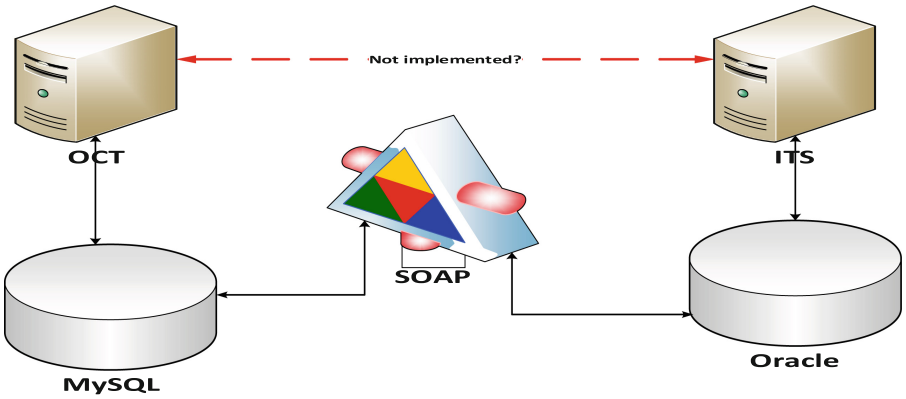

Fig. 1. Proposed integration model between OCT and ITS [Source: Adapted from [31] (p. 3)].

Notwithstanding the benefits that resulted from the use of OCT, statistics indicated that not a lot of intended audience was actually using the tool. Table 1 shows usage data for the majority of courses in Moshoeshoe[1] Department for the academic year 2014/5 (*August 2014 to May 2015*). Note that a few courses have been excluded from the list in Table 1 because they were not linked to any educator(s) in the period in question due to either one or more of the following reasons: Course(s) being taught by part timers; educator(s) who resigned; or not being offered that academic year. Moshoeshoe (See footnote 1) Department had 10 full-time educators (*since individuals teach more than one course*) in the selected time period. This implies that the average number of visits to OCT by Moshoeshoe (See footnote 1) Department educators from August 2014 to May 2015 was approximately 29 times. The average number of students enrolled into the Moshoeshoe (See footnote 1) Department courses visited OCT 0.03 times in the selected period. This number of visits was far below the number of visits by the educator of, and students enrolled into the BC [3] course (*199 and 1949 visits respectively*) (see Table 1). This study, therefore, is aimed at investigating the infusion (*the degree to which technology is deeply integrated into an area or department*) of the tool and its use by both students and educators at the selected higher education institution. Based on the Unified

[1] A specific name of the department has been withheld for anonymity purposes, and throughout the paper, reference to the department will be used as such.

Theory of Acceptance and Use of Technology (UTAUT), the paper specifically examines the factors that determine the use and/or non-use of OCT at the chosen institution.

In the remainder of this paper, a theoretical framework guiding this study together with a review of relevant background literature are presented in Sect. 2. This is followed by a discussion of the research design and methods in Sect. 3, and a presentation of the results and interpretation in Sect. 4. The significance of the study and limitations in using OCT are provided in Sect. 5, while conclusions and recommendations for future research are presented in Sect. 6.

Table 1. Usage data on Moshoeshoe[1] department courses for the academic year 2014/15 on the number of visits to OCT.

Course Code	Total # of students enrolled	# of Educators Linked to course	Total # of visits	# of visits by Educator(s)	# of visits by students	Average visits per Educator	Average visits per student
A1[0]	307	1	664	1	663	1	2
B1[0]	234	1	399	0	399	0	2
A2[0]	120	1	115	0	115	0	1
B2[0]	116	1	40	5	35	5	0
C2[0]	89	1	17	5	12	5	0
A3[0]	95	1	45	1	44	1	0
A3[1]	92	1	98	0	98	0	1
B3[0]	44	1	551	51	500	51	11
B3[1]	87	1	50	0	50	0	1
B3[2]	106	2	25	7	18	4	0
B3[3]	85	1	2148	199	1949	199	23
C3[0]	46	1	40	1	39	1	1
A4[0]	66	1	16	0	16	0	0
B4[0]	98	1	8	2	6	2	0
A4[0]	70	1	2	0	2	0	0
A4[1]	70	1	8	0	8	0	0
B4[0]	95	1	35	0	35	0	0
C4[0]	24	1	2	0	2	0	0
C4[1]	24	1	4	0	4	0	0
B4[1]	24	1	63	3	60	3	3
B4[2]	12	2	247	40	207	20	17
Total averages	**1904**	**23**	**4577**	**315**	**4262**	**292**	**63**

Legend: For the sake of anonymity, the module codes have been coded - The first alphabet represents a module; the second number represents level of study; and a number in square brackets represents the number of modules for the level of study.

2 Theoretical Framework

Associated with infusion and use of technological innovations are several models. These include, but are not limited to Motivational Model (MM) [11], Technology Acceptance

Model (TAM) [12], Diffusion of Innovations (DOI) Theory [32] and Theory of Planned Behaviour (TPB) [1]. It was not until 2003 that the eight models, including the just stated, were evaluated by [42]. The evaluation gave birth to the Unified Theory of Acceptance and Use of Technology (UTAUT) model. As its underlying theoretical framework, this study adopted this model. The model was chosen for this study because it explains at least 70% of user's behavioural intention to use a technological innovation, while the previous models only explain 30 to 60% of the user's intention [42].

2.1 UTAUT Model

In the UTAUT model, the key constructs that determine the behavioural intention to use and the actual use behaviour to use some technological innovation are defined. As the moderating and mediating factors may be inherent in one's actual use of some named innovation, the model also considers such factors [42]. This study, however, focuses on only the original four constructs to determine their impact on the behavioural intention and actual behavioural use of OCT. Similar to other studies [2, 24], the moderating factors (gender, age, experience and voluntariness of use) have been excluded in this study. Figure 2 depicts the theoretical framework of this study as adapted from the UTAUT model.

Performance Expectancy and Behavioural Intention

Performance expectancy (PE) is a conviction that users will gain benefits from the use of a system [42]. The benefits that may accrue from using a new system include increased productivity, increased performance, efficiency and time saving [35]. As per researchers in [42], performance embraces the concepts of perceived usefulness, extrinsic motivation, relative advantage, outcome expectations and job-fit. According to [41], perceived usefulness has been identified as the principal predictor in adopting a technology. Davis [12] (p. 320) defines perceived usefulness as "the degree to which a person believes that using a particular system would enhance his/her job performance". Behavioural intention (BI) is a measure of the strength of one's intention to perform a specified behaviour [42].

Several studies [14, 20, 24] have found that there is a significant positive relationship between performance expectancy and behavioural intentions to use named technological systems. These systems include 3G Mobile technology, E-government Services, Wireless Technology, and Digital Library.

H1: Performance expectancy has a positive effect on the behavioral intention to use OCT.

Effort Expectancy and Behavioural Intention

Venkatesh et al. [42] define effort expectancy (EE) as the degree of ease of use that is associated with the system. EE is composed of such constructs as perceived ease of use (PEOU), ease of use (EOU) and complexity. PEOU is a degree to which an individual believes that using a system would be free of effort. Complexity is the degree to which an individual perceives a system as relatively difficult to understand and use. EOU is the degree to which an individual perceives using an innovation as being difficult to use

[12]. A myriad of studies have found that effort expectancy positively influences user's behavioural intention to use technological systems [9, 15].

H2: Effort expectancy has a positive effect on the behavioral intention to use OCT.

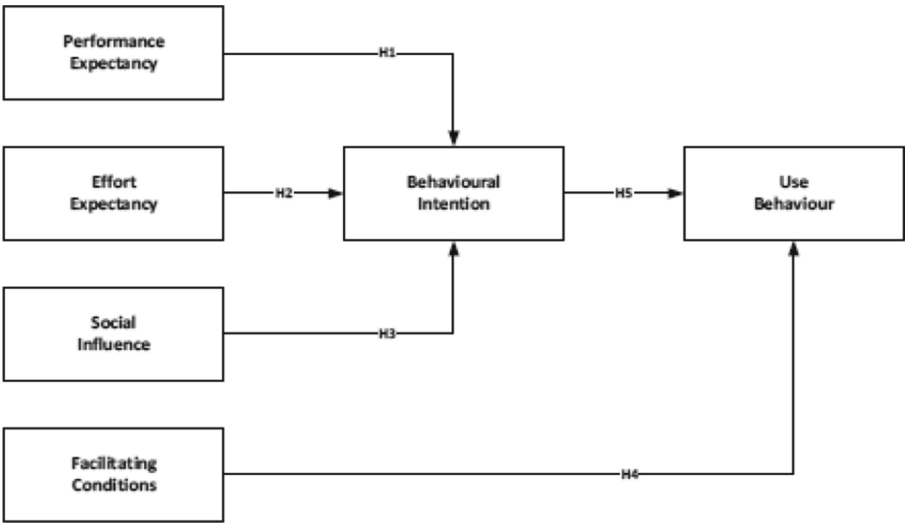

Fig. 2. Theoretical Framework of the study [Adapted from [42] (p. 447)]

Social Influence and Behavioural Intention

Social influence (SI) plays a key role in better understanding adoption logistics of any technology enabled or computerised system [42]. It is defined as the extent to which an individual perceives that people important to him/her believe that s/he should use the new system [42]. Social factors are defined as "the individual's internalisation of the reference group's subjective culture and specific interpersonal agreements that the individual has made with others in specific situations" [37] (p. 126). The influence could be from either friends, supervisors, colleagues or children. According to [22], social influence is a complex and delicate concept that can have an impact on people's decisions to use technology related systems. Several studies have found that social influence positively affects user's intention to use technological systems [3, 16, 18].

H3: Social influence has a positive effect on the behavioral intention to use OCT.

Facilitating Conditions and Use Behaviour

Facilitating conditions (FCs) are the objective factors in the environment that observers agree make an act easy to accomplish [42]. In the context of information systems, an example of a facilitating condition that can influence the usage of a system is provision of support to computer users [37]. In using OCT, it may be necessary to investigate whether the institution provides all the necessary resources to allow users to effectively use it. The resources may include expertise, infrastructure, policies, funding, support services,

and culture. Many studies have found that facilitating conditions positively affect user's behavioural intention to use technological systems [27, 43, 44].

H4: Facilitating conditions have a positive effect on the actual behavioural to use OCT.

Behavioural Intention and Use Behaviour

People have a tendency to form attitudes and intentions toward a new technology before they actually use it [1]. The attitudes and intentions come as a result of fearful expectations formed by perceptions, social influences and traditional or habitual behaviour [4]. Several studies have found that behavioural intention positively affects user's actual intention to use technological systems [13, 19, 30]. In using OCT, it may be necessary to examine how attitudes and intentions that users develop impact their actual use of the system.

H5: Behavioural intention has a positive effect on the actual behavioral to use OCT.

3 Research Methods

3.1 Design

This study was grounded on the UTAUT model [42] as the research design. Within this design, a quantitative approach [33] was followed. Data was collected by means of using a questionnaire. The study population consisted of senior students from a selected institution of higher education in Lesotho. The study was based on a convenient sample [33] of 216 respondents. The sample consisted of 84 first year, 116 third year and 16 fourth year students enrolled in the courses offered by Moshoeshoe[1] Department at the selected institution. The respondents were purposefully [5] drawn from five programs of study offered in this department. The choice of these groups was driven by the fact that they were familiar and had, at least once, used OCT (*actual use of OCT is one construct tested in the study).*

3.2 Data Collection

Two hundred and sixteen structured questionnaires were distributed to our respondents. Of these, 155 were filled-in and returned. Hence, the return rate was 72%, which according to [25] (p. 126) exceeds the minimum acceptability level of 70% for questionnaires. Of the 155 respondents, five did not indicate their gender, hence, making a valid percentage of 61% (*females*) and males accounting for the rest. Age-wise, 61% of the respondents were between 18 and 23 years inclusively; thirty-percent were between 24 and 29 years and those 30 years old and above accounted for less than 10%.

Prior to respondents filling-in the questionnaire, they were given a consent letter, which indicated the purpose of the study and the approximate time (*10 to 15 min*) to fill-in the questionnaire. The respondents were also assured that by filling-in the questionnaire, they were giving the researchers consent to use their information for research purposes only and that their responses would be treated in a manner confidential and their privacy would be protected to the maximum extent allowable by law. They were also notified that their response or non-response would not, in any way, affect their academic performance.

3.3 The Instrument

The structured questionnaire developed had two sections – Section A was capturing the demographic details of respondents, while Section B focused on the experiences of respondents with the use of OCT. Section B had 23 statements where respondents had to indicate the extent to which they agreed or disagreed with such statements about the use of OCT. The statements were testing mainly the five constructs namely: performance expectancy, effort expectancy, social influence, facilitating conditions and behavioural intention in relation to the use of OCT, on a four-point Likert scale (1–2–3–4). This scale was used in order to maximise reliability by not including a neutral choice for respondents [10].

3.4 Measurement and Reliability

Upon capturing data into the Statistical Package for Social Sciences (SPSS) and in order to test whether the scale used in this research was consistently reflecting the construct(s) being measured, reliability analysis was conducted. This led to deleting some items forming a construct. All the items were adapted from [42] (see Fig. 2). Several items were combined to form appropriate constructs.

The PE construct was measured using three items [Cronbach's alpha (α) = 0.75]. These items were adapted from [42]. The items were measured on a four-point Likert scale ranging from (1) strongly agree to (4) strongly disagree. Sample items were: "I find OCT useful in my learning"; "Using OCT enables me to accomplish tasks more quickly"; and "Using OCT increases my chances of performing well academically".

The EE construct was measured using five items ($\alpha = 0.86$). These items were adapted from [42]. The items were measured on a four-point Likert scale ranging from (1) strongly agree to (4) strongly disagree. The five used sample items were: "My interaction with OCT is clear and understandable"; "I find OCT easy to use"; "OCT is user friendly"; "Learning to use OCT is easy"; and "OCT is easy to interact with".

The SI construct was measured using five items, of which two had to be deleted (*I would use OCT if I needed to; and I use OCT because many people use it*) to improve on the scale (α *value moving from 0.42 to 0.64*). All the items were adapted from [42]. The items were measured on a four-point Likert scale ranging from (1) strongly agree to (4) strongly disagree. The three used sample items were: "People who influence my behaviour think that I should use OCT"; "Other people expect me to use OCT"; and "People important to me expect me to use OCT".

The FCs construct was originally measured using three items, of which one had to be deleted (*Technicians are available to assist me with the difficulties I encounter with OCT*), hence, leading to better internal reliability (α *value moving from 0.47 to 0.62*). The BI construct was measured using six items ($\alpha = 0.88$). All the items were adapted from [42]. The items were measured on a four-point Likert scale ranging from (1) strongly agree to (4) strongly disagree. The two used sample items were: "I have the resources necessary to use OCT" and "I have the knowledge necessary to use OCT".

Use behaviour (UB) was measured using two items as follows: *(1) How often do you log onto OCT from home? and (2) How many times do you log onto OCT per day?* The first item was adapted from [6]. Both of these items used four categories (*Never, Once,*

Twice and > 2 times), which were respectively given codes 0, 1, 2, and 3. Gender was coded "0" for males and "1" for females. Age (*in years*) was categorised into four ranges [(18–23), (24–29), (30–35), and above 35], and these ranges were respectively coded 1, 2, 3, and 4. Year of study was ranging from "Year 1" through "Year 4" and were coded 1, 2, 3 and 4 respectively. Experience with computers (*years*) was categorised into four ranges [(0–5), (6–10), (11–15), and above 15], and these ranges were respectively coded 1, 2, 3, and 4. The first time use of OCT was given four labels [*Never Used, Semester 1 (2014), Semester 2 (2014), Semester 1 (2015)*] and their respective codes were 0, 1, 2, and 3.

4 Results and Interpretation

In this study, data was analysed through using SPSS. The tests employed are zero order correlations and regression analysis. The latter was used due to limitations associated with zero order correlations. One main limitation is that simple correlation does not regulate the counterfeit relationships that may come as a result of such other variables as demographic.

Table 2 shows a correlation matrix that indicates means, standard deviations and bivariate correlations of variables. All the means of the main variables center around 2 (*agree*), which implies that on average most of the respondents agreed with the statements that were tested in this study. Table 3 indicates the results for the linear regression analysis. The presentation below is based on information from Tables 2 and 3.

4.1 Hypothesis 1

Hypothesis 1 had predicted that performance expectancy has a positive effect on the behavioural intention to use OCT. Correlation analysis initially found that PE really had a positive and significant effect on BI ($r = 0.56$, $p \leq 0.01$). When all other variables were controlled, the correlational finding was confirmed ($\beta = 0.26$, $p \leq 0.01$). This significant relationship suggests that students were eager to use OCT because they believed they could benefit a lot from its use. This finding resonates with findings of previous studies [14, 20, 24]. Findings in regard to Hypothesis 1 suggest that the digital native students are definitely willing to embrace the new technologies. However, there may be various reasons why this is the case. Most of the students in this generation are interested in just playing around with the technology and related gadgets. This is to such an extent that some of them even spend more time with their technological gadgets than they have to, at times playing games and visiting social networking sites. In the same spirit, some can be attracted by the content that is related to their school work, hence, take advantage of that to perform well in their studies. Another reason that attracts students into being glued up with the technological gadgets is that they are a generation that is lazy to read – they would rather listen to an audio text than to read the actual text. Hence, it is not surprising that they hold a belief that they can always benefit from the use of the technology related systems.

4.2 Hypothesis 2

A similar pattern of results (to H1) was obtained in relation to hypothesis 2 since it was correlationally found that effort expectancy had a positive and significant effect on the behavioural intention to use OCT ($r = 0.68$, $p \leq 0.01$). After controlling for all the other variables, the correlational finding was confirmed ($\beta = 0.34$, $p \leq 0.01$). This relationship proposes that, of the factors that attracted students to use OCT and kept them using it was the ease of use [12, 29, 39] that was associated with it.

4.3 Hypothesis 3

A different pattern of results (from H1 and H2) was obtained in relation to hypothesis 3 because it was correlationally found that social influence had a positive and significant effect on the behavioural intention to use OCT ($r = 0.30$, $p \leq 0.01$). Upon controlling for all the other variables, the correlational finding was not confirmed as student intentions to use OCT under social influence were advancing away from zero ($\beta = 0.08$, $p \geq 0.05$). This relationship suggests that students did not use OCT because they had been influenced by people around them. Even though students may be eager to experiment with the technological gadgets and related application(s), they may as well be discouraged from using the technology/system because they have a perception that it is not easy to use. Immediately after forming that perception, they can completely stop using the system/technology or they may only concentrate on the aspects of the technology/system that excite them.

As an example, if the OCT has the chat component, students might just use OCT for chatting purposes only and forget about the principal aim for which OCT was designed and implemented. Therefore, this implies that educators as well must be brought on board to ensure that they give assignments or activities that may require students to use OCT in dealing with such. This might go a long way in helping users of a named system to benefit academically or otherwise from using such a system. This is interesting because the study finds that, though students are attracted to using OCT and keep using it, they have not been influenced by anyone to do so. This implies that a lot of benefits can be reaped from using the system if all the relevant parties that must take part are effectively doing so.

4.4 Hypothesis 4

In relation to hypothesis 4, the same pattern of results to hypothesis 3 was found. This is because it was initially found that facilitating conditions had a positive and significant influence on the actual behaviour to use OCT ($r = 0.28$, $p \leq 0.01$). However, when all the other variables were controlled, the facilitating conditions had no influence on the actual behaviour to use OCT ($\beta = -0.03$, $p \geq 0.05$). This relationship suggests that students felt that the environment was conducive for them to really use OCT to achieve their objectives. Prior training (as part of facilitating conditions) is equally important because for one to use the system/technology effectively s/he has to be equipped with the right skills including knowing what the system or technology is aimed at. This might help individuals to prioritise the use of the system by focusing on the secondary aspects

Table 2. Correlation Matrix (*means, standard deviations and bivariate correlations of variables*).

Variable	Mean	δ	1	2	3	4	5	6	7	8	9	10	11
1. PE	2.26	0.68	1.00										
2. EE	2.09	0.72	0.59**	1.00									
3. SI	2.25	0.66	0.25**	0.25**	1.00								
4. FCs	1.99	0.74	0.41**	0.65**	0.23**	1.00							
5. BI	2.01	0.70	0.56**	0.68**	0.30**	0.57**	1.00						
6. Gender	0.61	0.49	0.07	0.04	0.07	-0.05	0.78	1.00					
7. Age	1.51	0.75	-0.20*	-0.22**	-0.15	-0.13	-0.27**	0.14	1.00				
8. YOS	2.59	0.60	-0.30**	-0.27**	-0.06	-0.13	-0.39**	0.08	-0.34**	1.00			
9. EWCs	1.82	0.89	0.08	0.01	-0.03	0.17*	-0.03	0.14	-0.05	-0.00	1.00		
10. FTUoT	1.82	0.92	-0.14	-0.25**	-0.00	-0.13	-0.18*	0.11	-0.14	-0.25**	-0.06	1.00	
11. UB	1.28	-0.08	0.39**	0.37**	0.24**	0.28**	0.42**	0.08	0.07	0.27**	-0.10	0.11	1.00

Note: **= correlation significant at 0.01 level (2-tailed); *= correlation significant at 0.05 level (2-tailed); **δ**=Standard Deviation; PE=Performance Expectancy; EE=Effort Expectancy; SI=Social Influence; FCs=Facilitating Conditions; BI=Behavioural Intention; YOS=Year Of Study; EWCs=Experience With Computers; FTUoT=First Time Use of OCT; LFfH=Login Frequency from Home; LF/D=Login Frequency per Day.

Table 3. Linear regression analysis results.

	Model 1	Model 2	Model 3
Variable	**Behavioural Intention**	**Use Behaviour**	**Use Behaviour**
Performance expectancy	0.26**	-0.21*	-0.18
Effort expectancy	0.34**	-0.16	-0.12
Social Influence	0.08*	-0.18*	-0.15
Facilitating Conditions	0.17*	-0.03	0.01
Gender	-0.03	0.09	0.07
Age	-0.08	-0.06	-0.05
Year of study	-0.21**	0.16	0.12
Experience with computers	-0.09	-0.09	-0.09
First time use of OCT	0.04	-0.03	-0.03
Behavioural intention	-	-	-0.15
R	0.79	0.50	0.49
R^2	0.62	0.25	0.24

Note: **= correlation significant at 0.01 level (2-tailed); *= correlation significant at 0.05 level (2-tailed). Values of Regression Coefficient (β) represented here are the standardised ones.

at a later stage when the imperative business is done. It is also important to note that the digital native students are not concerned about whether the institution where they are studying has computer resources or not. This is because almost all students have computer gadgets that are Wireless Access Point (WAP)-enabled (iPad, laptop, iPhone, etc.) at their disposal. Therefore, whether the institution has enough computers, acceptable and easily available internet connectivity, sufficient Wi-Fi hot-spots, acceptable number of technicians or not, students still continue to use the related technology/systems. They

would rather purchase data bundles from a service provider or a configured modem so that they can connect to the Internet and use a related system or technology (*i.e., to download learning materials, assignments, test or assignment feedback*) irrespective of time and location (*any time anywhere*).

4.5 Hypothesis 5

Hypothesis 5 had predicted that behavioural intention has a positive effect on the actual use of OCT. Correlation analysis initially found that BI really had a positive and significant effect on UB ($r = 0.42$, $p \leq 0.01$). This initial finding was not confirmed when all the other variables were controlled ($\beta = -0.15$, $p \geq 0.05$). This relationship suggests that the behavioural intention of students to use OCT did not have any influence on their actual behaviour to use it. In testing Hypothesis 5, three procedures were followed. The mediator variable (behavioural intention) was first regressed on the independent variables PE, EE and SC. The dependent variable (use behaviour) was then regressed on the same three independent variables (PE, EE, and SC). Then the same dependent variable was regressed on both the three independent variables and a mediator (BI). Students of this age are independent, techno-savvy, entrepreneurial, hardworking and thrive on flexibility [38]. They also have easy access to cell phones, personal pagers, and computers [21]. These factors make them to, whether they have intentions or not, use the technology/systems at their disposal. This is attributed to the fact that the students who participated in this study indicated no intentions to use OCT, but at the end of the day, they actually used it.

5 Significance of the Study

The study contributes to literature and in practice. In literature, it contributes to the body of knowledge in the field of the use of technology for teaching and learning at higher education institutions. It also helps in understanding the perceptions held by students at higher education level with regard to the use of technology in teaching and learning. Furthermore, the UTAUT model seems not to have been employed in the setting where the study was carried out, but has been applied many times in the Western setting. Therefore, considering the culture of people (e.g., Basotho) where this study was conducted such as their thinking abilities, social interactions, resources at their disposal and several other aspects, this study has produced interesting results.

One of the top-executives of the selected institution asserts "the good news is that staff and students seem to have embraced OCT as evidenced by the use of the system following the training programme" [28] (p. 1). However, as evidenced above, this did not seem to be what is on the ground at least in the first academic year upon acquiring and using OCT. Hence, in practice, top management of the selected institution is highly likely to benefit from the findings of this paper. Moreover, the OCT designers and developers may also benefit from the findings of this paper. OCT provides both the mobile view and full view. However, students were struggling to complete assignments using their cellphones because of some challenges encountered with the mobile view. Students normally encountered problems in that they were not even sure when their submissions

had gone through (i.e., no notification of submission). As a result they (students) had to physically consult with their educators to confirm their submissions. This causes unnecessary workload on educators, and in responding to the continuous monitoring call [17], they would not even have to wait for students to ask, but proactively make the designers aware of the need for such functionalities to be incorporated in OCT.

6 Conclusions and Future Work

The aim of this study was to examine the factors that determine the use and/or non-use of OCT at the selected institution. Having followed the UTAUT model, the study concludes that, of the investigated hypotheses, performance expectancy (PE) and effort expectancy (EE) positively influence the behavioural intention to use the online collaborative tool (OCT); while social influence (SI), facilitating conditions (FCs) and behavioural intention (BI) do not have a significant influence on the students to use OCT. The findings indicate that students actually use technology irrespective of whether they think they will learn or not learn from using it. However, they are interested only in some components that each finds interesting to use. The students completely ignore the other system/technology components that they are not interested in. Hence, future studies may investigate ways to make students use most of the components of the system/technology.

Furthermore, in as far as using technology in the learning process is concerned, students do not have a problem because they already have technological gadgets. Perhaps the story would be different if they had to go an extra mile to secure such gadgets. This is why the findings of this study are in agreement with [42] that the behavioural intention does not mediate the direct relationship between facilitating conditions and the actual behavior to use the system. However, the findings implicate that behavioural intention does not have to mediate the relationship between social influence and the actual behavior to use the system/technology.

The findings of this study imply that technology plays a vital role in the learning of students if used effectively. It also suggests that all parties that must partake in using the system/technology must do so in order that its benefits are realised. This is irrespective of whether cultures, thinking abilities, social interactions and resources are concerned. A follow-up study to investigate the status-quo at the institution can be conducted as far as the use of OCT is concerned.

References

1. Ajzen, I.: The theory of planned behavior. Org. Behav. Hum. Decis. Proceses **50**(2), 179–211 (1991). https://doi.org/10.1016/0749-5978(91)90020-T
2. Attuquayefio, S.N., Addo, H.: Using the UTAUT model to analyze students' ICT adoption. Int. J. Edu. Dev. Infor. Comm. Technol. **10**(3), 75–86 (2014)
3. Ayaz, A., Yanartaş, M.: An analysis on the unified theory of acceptance and use of technology theory (UTAUT): acceptance of electronic document management system (EDMS). Comput. Hum. Behav. Reports **2**, 1–7 (2020). https://doi.org/10.1016/j.chbr.2020.100032
4. Bagozzi, R.P., Davis, F.D.D., Warshaw, P.R.: Development and test of a theory of technological learning and usage. Hum. Relat. **45**(7), 659–686 (1992). https://doi.org/10.1177/001872679204500702

5. Bernard, H.R.: Research methods in Anthropology. Rowman and Littlefield Publishers, New York (2017)
6. Brown, R., Ogden, J.: Children's eating attitudes and behaviour: a study of the modelling and control theories of parental influence. Health Educ. Res. **19**(3), 261–271 (2004). https://doi.org/10.1093/her/cyg040
7. Centre for Innovation in Learning and Teaching: Vula - What is Vula? Vula Features. Training & Resources (2021). http://www.cilt.uct.ac.za/cilt/vula Accessed 11 Feb 2021
8. Centre for Teaching and Learning: Blackboard (2021). https://www.ufs.ac.za/ctl/home-page/ctl-registration-support-2021/blackboard. Accessed 14 Apr 2021
9. Chen, P.Y., Hwang, G.J.: An empirical examination of the effect of self-regulation and the unified theory of acceptance and use of technology (UTAUT) factors on the online learning behavioural intention of college students. Asia Pacif. J. Edu. **39**(1), 79–95 (2019). https://doi.org/10.1080/02188791.2019.1575184
10. Chyung, S.Y.Y., Roberts, K., Swanson, I., Hankinson, A.: Evidence-based survey design: the use of a midpoint on the likert scale. Perfor. Improv. **56**(10), 15–23 (2017). https://doi.org/10.1002/pfi.21727
11. Davis, F.D., Bagozzi, R.P., Warshaw, P.R.: Extrinsic and intrinsic motivation to use computers in the workplace. J. Appl. Soc. Psychol. **22**(14), 1111–1132 (1992)
12. Davis, F.D.: Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Q. Manag. Infor. Syst. **13**(3), 319–339 (1989). https://doi.org/10.2307/249008
13. Deng, S., Liu, Y., Qi, Y.: An empirical study on determinants of web based question-answer services adoption. Online Infor. Rev. **35**(5), 789–798 (2011). https://doi.org/10.1108/14684521111176507
14. Dhaha, I.S.Y.A., Ali, A.Y.S.: Mediating effects of behavioral intention between 3G predictors and service satisfaction. Malays. J. Comm. **30**(Special Issue), 107–128 (2014). https://doi.org/10.17576/jkmjc-2014-30si-07
15. Donmez-Turan, A.: Does unified theory of acceptance and use of technology (UTAUT) reduce resistance and anxiety of individuals towards a new system? Kybernetes **49**(5), 1381–1405 (2019)
16. Durak, H.Y.: Examining the acceptance and use of online social networks by preservice teachers within the context of unified theory of acceptance and use of technology model. J. Comput. High. Educ. **31**(1), 173-209 (2019). https://doi.org/10.1007/s12528-018-9200-6
17. Franzoni, V.: Artificial intelligence visual metaphors in E-Learning interfaces for learning analytics. Appl. Sci. **10**(20), 2–25 (2020). https://doi.org/10.3390/app10207195
18. Hoque, R., Sorwar, G.: Understanding factors influencing the adoption of mHealth by the elderly: an extension of the UTAUT model. Inter. J. Med. Infor. **101**, 75–84 (2017). https://doi.org/10.1016/j.ijmedinf.2017.02.002
19. Im, I., Hong, S., Kang, M.S.: An international comparison of technology adoption: testing the UTAUT model. Infor. Manag. **48**(1), 1–8 (2011). https://doi.org/10.1016/j.im.2010.09.001
20. Kim, S., Lee, K.H., Hwang, H., Yoo, S.: Analysis of the factors influencing healthcare professionals' adoption of mobile electronic medical record (EMR) using the unified theory of acceptance and use of technology (UTAUT) in a tertiary hospital. BMC Med. Infor. Decis. Mak. **16**(1), 1–13 (2016). https://doi.org/10.1186/s12911-016-0249-8
21. Lancaster, L.C., Stillman, D.: When generations collide: who they are. Why they clash. How to solve the generational puzzle at work. Harper Collins Publishers, Inc., New York (2003)
22. Lee, Y., Lee, J., Lee, Z.: Social influence on technology acceptance behavior: self-identity theory perspective. ACM SIGMIS Database: DATABASE Adv. Infor. Sys. **37**(2–3), 60–75 (2006). https://doi.org/10.1145/1161345.1161355

23. Ma, S.: Fast or free shipping options in online and omni-channel retail? The mediating role of uncertainty on satisfaction & purchase intentions. Inter. J. Logist. Manag. **28**(4), 1099–1122 (2017). https://doi.org/10.1108/IJLM-05-2016-0130
24. Maqableh, W., Mhamdi, C., Al Kurdi, B., Salloum, S.A., Shaalan, K.: Studying the social media adoption by university students in the United Arab Emirates. Inter. J. Infor. Technol. Lang. Stud. **2**(3), 83–95 (2018)
25. McClelland, S.B.: Organizational Needs Assessments: Design, Facilitation and Analysis. Quorum Books, Westport, London (1995)
26. McCrindle, M., Fell, A.: Understanding Generation Z: Recruiting, Training and Leading the Next generation. McCrindle Research Pty Ltd., Norwest, AU (2019)
27. Mosweu, O., Bwalya, K.J., Mutshewa, A.: A probe into the factors for adoption and usage of electronic document and records management systems in the Botswana context. Infor. Dev. **33**(1), 97–110 (2017). https://doi.org/10.1177/0266666916640593
28. Moteete, M.: A quarterly newsletter of the National University of Lesotho: Maiden issue. Quarterly newsletter (2014). https://thuto.nul.ls/access/content/group/communications and marketing/NUL News- Maiden issue June to September 2014.pdf. Accessed 12 Nov 2019
29. Preece, J., Rogers, Y., Sharp, H.: Interaction Design: Beyond Human-Computer Interaction, 4th edn. John Wiley & Sons Inc, New Delhi (2015)
30. Pynoo, B., Devolder, P., Tondeur, J., Van Braak, J., Duyck, W., Duyck, P.: Predicting secondary school teachers' acceptance and use of a digital learning environment: a cross-sectional study. Comput. Hum. Behav. **27**(1), 568–575 (2011). https://doi.org/10.1016/j.chb.2010.10.005
31. Ramaboli, A.L., Mphatsi, L., Keta, K.: Thuto: Educate, learn and collaborate (Unpublished Project proposal) (2014)
32. Roger, E.M.: Diffusion of Innovations, 4th edn. Free Press, New York (1995)
33. Saunders, M.N.K., Lewis, P., Thorhill, A.: Research Methods for Business Students, 8th edn. Pearson Education Inc, Harlow (2019)
34. Selyer, C., Mugova, C.: An Investigation into the impact of E-commerce, M- commerce and modern technology on the translation industry in South Africa. J. Manag. Admin. **1**, 1–23 (2017)
35. Srinivasan, S.S., Anderson, R., Ponnavolu, K.: Customer loyalty in e-commerce: an exploration of its antecedents and consequences. J. Retail. **78**(1), 41–50 (2002). https://doi.org/10.1016/S0022-4359(01)00065-3
36. Sullins, J.: Information technology and moral values. In: Zalta, E.N. (ed.) The stanford encyclopedia of philosophy (2021). https://plato.stanford.edu/archives/spr2021/entries/it-moral-values/. Accessed 25 Mar 2021
37. Thompson, R.L., Higgins, C.A., Howell, J.M.: Personal computing: toward a conceptual model of utilization. MIS Q. Manag. Info. Sys. **15**(1), 125–142 (1991). https://doi.org/10.2307/249443
38. Tulgan, B., Martin, C.A.: Managing Generation Y: Global Citizens Born in the Late Seventies and Early Eighties. HRD Press, Amherst, MA (2001)
39. Tullis, T., Albert, B.: Measuring the User Experience: Collecting, Analyzing, and Presenting Usability Metrics, 2nd edn. Morgan Kaufmann, Waltham, MA (2013)
40. Uwameiye, B.E.: Application of information and communication technology (Icts) in the effective teaching and learning of Home Economics in secondary schools in Nigeria. Europ. Sci. J. **11**(7), 1857–7881 (2015)
41. Venkatesh, V., Davis, F.D.: A theoretical extension of the technology acceptance model: Four longitudinal field studies. Manag. Sci. **46**(2), 186–204 (2000). https://doi.org/10.1287/mnsc.46.2.186.11926
42. Venkatesh, V., Morris, M.G., Davis, G.B., Davis, F.D.: User acceptance of information technology: toward a unified view. MIS Q. **27**(3), 425–478 (2003)

43. Wentzel, J.P., Diatha, K.S., Yadavalli, V.S.S.: An application of the extended technology acceptance model in understanding technology-enabled financial service adoption in South Africa. Dev. Southern Africa **30**(4–5), 659–673 (2013). https://doi.org/10.1080/0376835X.2013.830963
44. Wu, Y.L., Tao, Y.H., Yang, P.C.: The use of unified theory of acceptance and use of technology to confer the behavioral model of 3G mobile telecommunication users. J. Stat. Manag. Syst. **11**(5), 919–949 (2008). https://doi.org/10.1080/09720510.2008.10701351
45. Zhou, T., Lu, Y., Wang, B.: Integrating TTF and UTAUT to explain mobile banking user adoption. Comput. Hum. Behav. **26**(4), 760–767 (2010). https://doi.org/10.1016/j.chb.2010.01.013