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Enhancing the use of Web 2.0 Technologies in Higher Education: Students' and Lecturers' Views

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ABSTRACT

Learning quality enhancement with Web 2.0 tools needs good implementation framework and lessons from best practice. However, there is not much research on what constitutes best practice in the implementation of Web 2.0 in learning activities. This research seeks to fill this gap by seeking the views of students and lecturers on increased adoption of Web 2.0 social tools in learning activities. The research reports on the quantitative and qualitative study carried out in UK. This research reveals that improved learning experience with the use of Web 2.0 tools in higher education is positively related to perceived usefulness, perceived ease of use, prior knowledge, motivation to use, social factors, facilitating condition and performance expectancy.

Keywords: Technology adoption, social technology tools, teaching and learning

INTRODUCTION

Research shows that the impact of using technology in learning is hard to distinguish from the effect of other support that may accompany its use, especially when pedagogical changes that take place have no relationship with technology (JRC Report, 2010). It is certain and evident that higher education can be transformed significantly through changes in the way learners and teachers understand and play their roles in learning and teaching activities, with or without technology (Fry et al, 2008) hence the need to evaluate learning quality after introducing a new technology. Learning quality enhancement with Web 2.0 tools needs good implementation framework (Baxter et al, 2011). Also there is the need to seek for best ways to have successful implementation but not much research on good practice are reported in literature. It has been observed that since 2005 the main effect of the initiative of technology enhanced learning in England, Scotland and Wales has been to bring to the knowledge of the institutions the relationship between technology provision, the use of technology and its impact on students learning (JRS, 2010). The rest of this paper will present the background, the research questions, the method adopted to answer the questions, literature review, hypotheses, primary data collection, analysis, discussions, comparison of qualitative and quantitative study, key findings, conclusion, limitations and future studies.

BACKGROUND

Support for the use of Web 2.0 platform for learning can be drawn from different arguments. This section will briefly present constructivist view, meaningful and reflective learning as good reasons for using this technology.

Constructivist view of learning

Literature supports student-directed learning whereby knowledge is constructed by the learner. Constructivist view of learning is believed to make learning more active, social and reflective (Driscoll, 2002). Many researchers see it as an effective learning strategy for students and teachers (Baxter et al 2011; Jucevičienė and Valinevičienė 2010; Kennelly, 2009; Jonassen, 1999). Web 2.0 provides this learning style because it is not a one way (teacher-centric) communication but allows students to easily participate and contribute to the learning material e.g. using blogs. The learner has the opportunity of constructing her own learning that should fit into her meta-cognition. One of the greatest challenges of technology in learning is determining whether it will provide real world contexts that engage learners in complex problem solving. Research have shown that the use of Web 2.0 technologies such as blogs, wikis and podcasts provide learners with opportunities to be involved in their learning, generating connections with their prior knowledge and linking it with the present activity (Richardson, 2006; Driscoll, 2002). Active learning helps learners to develop ideas and this brings about meaningful learning.

Meaningful learning

Learning becomes more meaningful when it involves demonstrating competence and increasing participation in contributing to a social community (Driscoll, 2002). Meaningful learning occurs when learners engage in active, constructive, intentional, authentic, and cooperative learning and this is the primary goal of education (Jonassen, 1999). Thus, meaningful learning can be achieved with the use of dialogue-based Web 2.0 technologies such as blogs and discussion forums and this can increase relationships among groups of learners and also enhance the social basis for learning.

Reflective Learning

Reflection is a very important way of supporting learning (Driscoll, 2002). Feedback from peers and lecturers can help students to reflect. If reflection is done every day or weekly, it can improve critical thinking skills (Xie and Shama, 2010; Atherton, 2013). Reflection takes place in an individual learner's personal learning or as a part of a broader dialogue, within the context of the class or of social interactions with peers and teachers or lecturers. Hence, introducing Web 2.0 tools for learning activities can enhance reflection in a group activity. Driscoll (2002) acknowledged that integrating new experiences with prior knowledge and reflecting upon this process helps to build new mental models and create new meanings.

Irrespective of these potentials of Web 2.0 to learning, research indicates that Web 2.0 is not widely accepted in learning (Frankline and Harmeline, 2007; Baxter et al., 2011; Bikanka, 2014) even though students widely use the technology for social purposes (Baxter et al., 2011). There is also a lack of a general framework for evaluating user acceptance of these technologies in teaching and

learning in higher education. The gap in knowledge on low use of Web 2.0 tools for learning necessitated the raising of research questions that follow.

Research questions

To address the gap in knowledge presented in the preceding section, the following research questions were formulated to guide the research:

- **What are the views of students regarding the factors that relates with the use of Web 2.0 social technologies in learning activities?**
- **How can adoption of Web 2.0 tools use be increased to achieve improved students' learning experience?**

METHODOLOGY

The research started with secondary study (literature review) of technology acceptance models to provide a theoretical underpinning. In particular TRA, TAM and UTAUT were examined to select constructs that were used to build a theoretical model for this study. On the primary research, the study used a mixed method in three major stages.

The first stage of the primary study was a pilot observational study of 10 students after the researchers had taught them in a UK institution. The students were not given much awareness of the use of Web 2.0 tools. This group had to use blogging to complement their learning but they hardly used it and therefore after the semester they were interviewed on reasons for not using these tools for their learning activities. A few lecturers were also interviewed. The purpose of the exercise was to derive themes which were matched with those obtained from technology acceptance literature review. Variables from this study were used to build a research model.

The second stage was quantitative which operationalised the research model into a questionnaire (closed and open ended) responded to by 201 students and 69 lecturers from 5 universities in the UK. Data was then analysed to validate the hypotheses.

The third stage was a follow-up (mainly) qualitative action research to deepen understanding of the validated variables and to develop a framework for practice. The researcher joined, as a student, a class of 26 who used discussion forum to complement their face-to-face learning. She observed that while the teachers used it to pass information and request response from students, the latter's participation was very low. She revealed herself as a researcher to the two lecturers involved at the end of the semester. She interviewed them, educated them on how to motivate their students whom the lecturers complained were hardly using the Web 2.0 learning technology. She also interviewed the students. The interviews to the two lecturers and students served as a pre-treatment. The treatment (intervention) was done by the researcher and the two lecturers who spoke to the students to give them knowledge of effective use and the advantages of participating in the discussion forum. The briefing also meant to motivate them. The briefing occurred before the second semester at the end of which the post-treatment measures were taken by way of a questionnaire. This mixture of methods is acceptable in this type of investigation (Gribich, 2013; Onwuegbuzie and Johnson, 2006; Onwuegbuzie, 2003). Technology acceptance literature is discussed in the next section.

LITERATURE REVIEW

User acceptance of technology

Various theories have been developed to predict acceptance of technology. The theory of reasoned action (TRA) Ajzen and Fishbein (1975), which originated from social psychology, was the first theory to predict acceptance of technology. The TRA explains the relationships between beliefs, attitudes, norms, intentions, and behavior. This theory argues that individual's behavior in acceptance or rejection of technology is determined by the person's intention to perform this behavior and the intention is influenced jointly by the individual's attitude and subjective norm. However the original TRA has a construct motivation which was silent in the theory, but may be useful in this research.

The TRA was later extended to theory of planned behaviour (TPB) (Ajzen 1980) to allow for behaviours not under complete volitional control and this also provides the reason why intentions do not always predict behaviours. Armitage and Connor (2001) studied 185 researches that used TPB until 1997 and found that subjective norm was a weak variable in predicting behavioural intention. Their reports also showed that TPB accounted for 27% and 39% of variance in behaviour and intention, respectively, but attitude and subjective norm accounted for a significant variance in individual desire than intention or self-prediction and these two were better predictors of behaviour.

Other theories of acceptance were extended from TRA e.g. technology acceptance model (TAM) (Davis et al. 1989) and unified theory of acceptance and use of technology (UTAUT) (Venkatesh et al., 2003). TAM is one of the theories that have been used by a lot of researchers (e.g. Davis et al. 1989; Venkatesh et al. 2003; Teo, Su Luan & Sing, 2008; Usluel & Mazman, 2010; Straub, Keil & Brenne, 1997). However, TAM was found to be culture dependent as it was not valid in some cultures e.g. Japanese (Straub, Keil & Brenner, 1997), Malaysian and Singaporean (Teo, Su Luan and Sing, 2008). Some newer models have been developed extending from TAM with other constructs for different purposes in learning environments (Fetscherin & Lattermann 2008). Some of these constructs include technical support, class room dynamics and compatibility, social presence, perceived credibility and computer-efficacy, flow experience, intrinsic and extrinsic motivation.

The Unified Theory of Use and Acceptance of Technology UTAUT was developed using a combination of eight models namely: theory of reasoned action, theory of planned behaviour, motivational model, social cognitive theory, model of PC utilization, innovation diffusion theory (IDT), and technology acceptance model (TAM1 and TAM2). The UTAUT posits that performance expectancy, social factor, facilitating condition and self-efficacy influence behavioural intention and actual use and these factors are moderated by age, gender and voluntariness. UTAUT attempts to explain the relationships between behaviour intention on the one hand and acceptance and use of technology on the other.

The UTAUT has been used and validated in business and some educational contexts (e.g. Venkatech et al., 2003; Oshiyanki, Cairns and Thimbleby, 2007) in different cultures (e.g. Czech Republic, Greece, India, Malaysia, New Zealand, Saudi Arabia, South Africa, United Kingdom, and United State), but has not been tested for acceptance of Web 2.0 tools for learning activities in the UK.

TAM, UTAUT and TRA serve as theoretical underpinnings of this research. Hence the hypotheses is developed in the next section.

Hypotheses

Hypotheses were developed from the Technology Acceptance Model (TAM) (Davis et al., 1989), the Theory of Reasoned Action (TRA) (Ajjan & Fishbein, 1980), Unified theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003). These models served as theoretical underpinning for this research. One additional construct (prior knowledge) was developed from a pilot study which was carried out after the literature review. The rest of the section presents an explanation of each construct and the relationships that were hypothesised between them and intention to use Web 2.0 technologies for learning activities.

Perceived usefulness (PU).

Perceived usefulness is the belief that the use of technology will improve and progress the work or learning activity of an individual or organization. Research by Davis et al. (1989) and Venkatesh et al. (2003) found that perceived usefulness influenced technology acceptance. This research examines the effect of perceived usefulness with regards to Web 2.0 technologies for learning with the hypothesis:

H₁: There is a positive relationship between perceived usefulness and behaviour intention to use Web 2.0 technologies for learning activities in higher institutions.

Social Factors (SF)

Social factors in this context arise from the impact of social environment on individual behaviour. This could be communication and interaction with students and lecturers which may result in interpersonal agreements that affect the behaviour of individuals in a group (Guerin, 1993; Taylor and Todd, 1995; Aiello and Douthitt, 2001; Venkatesh et al., 2003). This factor was included in the Davis et al. (1989) model as an external factor which may influence technology acceptance. This variable is also included in the UTAUT. This research seeks to validate the impact of social factors on Web 2.0 acceptance. Therefore:

H₂: Social factors have a positive relationship with behaviour intention to use Web 2.0 technologies for learning activities in higher institutions.

C. Prior Knowledge (PK)

Prior knowledge can be described as knowledge of a set of circumstances which is sufficient to take actions based on those circumstances. Prior knowledge in this context can be explained as being a combination of a learner's knowledge and experience of something which can be helpful and useful in learning environments (Kujawa and Huske, 1995; Mitchell et al., 2005). This knowledge or experience could positively influence acceptance of Web 2.0 technologies for learning, hence the following hypotheses:

H₃: Prior knowledge has a positive relationship with behaviour intention to use Web 2.0 technologies for learning activities in higher institutions.

D. Facilitating conditions (FC)

Access to internet facilities, the availability of good internet signals and the cost of broadband can be regarded as facilitating conditions for the use of Web 2.0 tools for learning, and may influence the use of Web 2.0 technologies in higher education. Thus, it can be hypothesized that:

H₄: There is a positive relationship between facilitating conditions and behaviour intention to use Web 2.0 technologies for learning activities in higher institutions.

E. Perceived Ease of Use (PEoU)

Perceived ease of use is the degree to which an individual believes that the use of technology will be without much effort, whilst helping to achieve much in a short time (Davis et al., 1989; Mitchell et al., 2005). This concept was used by Davis et al. (1989) to predict acceptance of technology, and this research will suggest that perceived ease of can predict acceptance of Web 2.0 in higher education, hence the hypothesis:

H₅: There is a positive relationship with perceived ease of use and behaviour intention to use Web 2.0 technologies for learning activities in higher institutions.

F. Performance Expectancy (PE)

Performance expectancy is the degree to which an individual or group expect to be proficient in their work or learning when using technology. Venkatesh et al. (2003) found that this variable had the capacity to promote technology acceptance. To investigate this in the case of acceptance of Web 2.0 technologies for learning in HEIs we use the hypothesis:

H₆: There is a positive relationship between performance expectancy and behaviour intention to use Web 2.0 technologies for learning activities in higher institutions.

G. Motivation to use (MtU)

Motivation to use in this context refers to internal or external support that provides the learner with the desire to act. Motivation to use can facilitate change in the behaviour of a learner (Ajzen and Fishbein 1975; Eccles and Wigfield, 2002; Fetscherin and Lattermann, 2008). Intrinsic and extrinsic motivation develops personal behaviour which can in turn affect evaluation of choice, goals and achievements. Thus, motivation to use Web 2.0 tools in learning is likely to influence attitude of the learners, and it should influence behavioural intention. As such, we hypothesise that:

H₇: There is a positive relationship between motivation and behaviour intention to use Web 2.0 technologies for learning activities in higher institutions.

Behavioural intention (BI)

Ajzen and Fishbein (1975) argued that an individual's performance of a specific behaviour is determined by their behavioural intention. Behavioural intention to use Web 2.0 technology tools can influence actual use. Thus the hypothesis:

H₈: Behaviour intention to use Web 2.0 for social purpose has an influence and positive relationship with actual use of Web 2.0 technologies for learning in higher institutions.
 The conceptual model is developed as shown in figure 1

The conceptual model in figure 1 developed to address this gap and evaluate user acceptance.

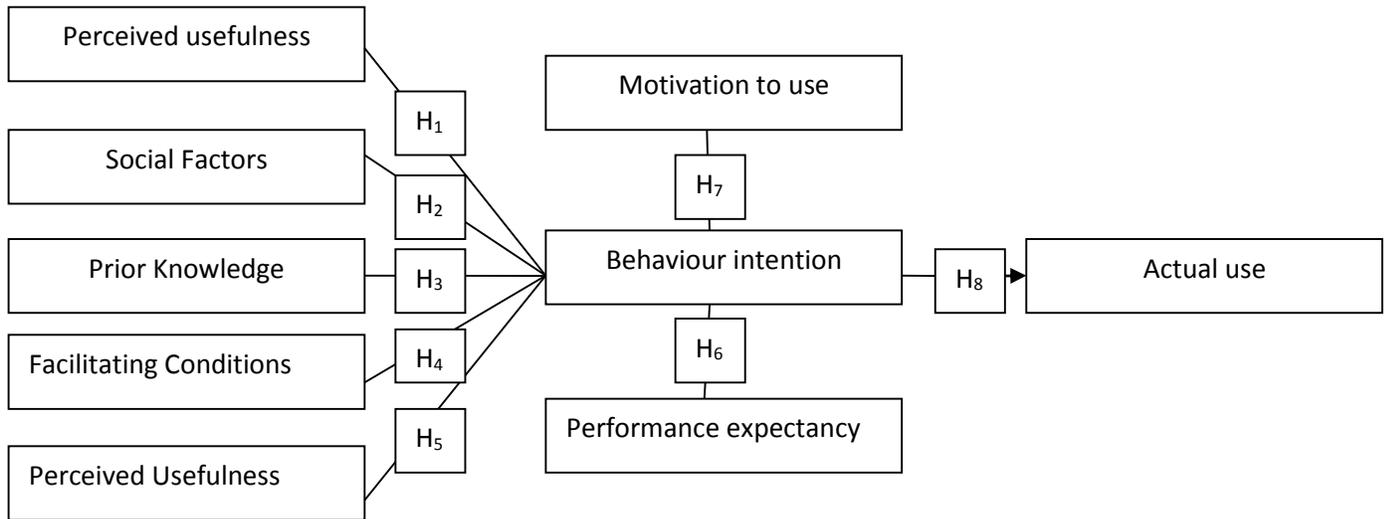


Figure 1: Conceptual model.

PRIMARY STUDY

Stage 1: Preliminary Study Using Blogs in Learning Activities

The researchers introduced the use of blogs to complement teaching in a class (2 adult students not yet in college or university, 2 college graduate, 2 undergraduate, 1 postgraduate and 3 company staff all between the age of 26 and 55). The students’ attitude to using blogs was checked in this process. The students were told the importance of interaction and participation in all learning activities and also advised to communicate by asking questions, commenting and responding to posts from the teacher and from each other. The students were also told to look out for an invitation to join the class blog. The students were all registered on this learning management system (LMS) and their login details were generated and sent to them via email.

Blogging was used to complement lectures during the teaching of Oracle database and SQL. This medium was used to distribute objectives, summaries, and questions from the lecturer. The researchers started with very simple tasks and progressed to more difficult ones.

The instructor also sent announcements and reminders on commenting and posting blogs. The researcher checked for invitation acceptance and also checked for the number of people who commented, read the posts or downloaded the labs and feedbacks. The teacher followed up on enhancing students’ participation through sending emails to get them to blog. The lecturer also

asked whether the students were aware of blogging and its usefulness in learning. These questions were raised in class and the majority of them raised their hands, indicating that they knew about blogging. The lecturer followed up by asking how many people blog? Only one hand was up. The students were encouraged to practice their coding in their personal blogs and also post blogs or questions in the class blogs; they were advised to ask questions anytime using the group blog. The facilitator continued to post the usual weekly objectives, summary of lectures and questions on the teaching objectives to the LMS. Figure 2 shows a screen view of one of the class activity.

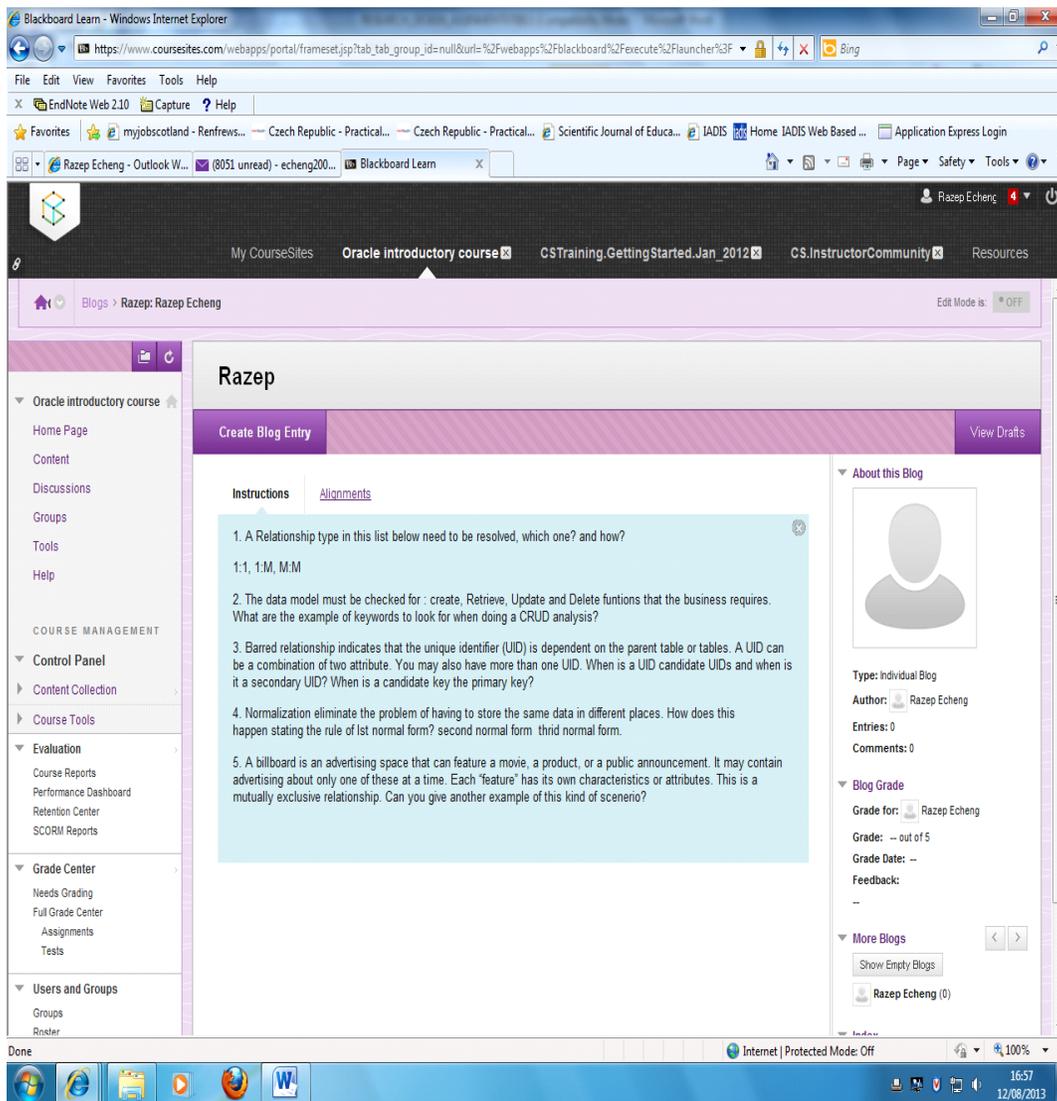


Figure 2: Database teaching with blogs.

At the end of the module, out of ten (10) registered students, 3 students dropped out without attending any class and one (1) student was not regular, while six (6) attended classes regularly. At the end of the sixth week, the teacher observed that six (6) students were logged in the LMS every week, but none posted a blog or commented on the teacher's blogs; they rather downloaded their feedback and lab materials.

Qualitative Data collection

The lecturer interviewed the students in group discussions after they consented to participate in the research by taking part in the discussion and filling the questionnaire. The group from the University of the West of Scotland discussed their reasons for not posting blogs or commenting on blogs during the learning period. This discussion was audio recorded and it lasted for one hour. To address research question 2, the researcher started by asking three questions which then led to other questions regarding their behaviour and how the use these tools could be increased in learning activities. The first three questions to students were:

- 1. Please what were your reasons for not posting blogs or commenting?**
- 2. What will motivate your participation and enhance your learning with blogs?**
- 3. How can these blogs be used effectively by students?**

The questions were answered in a group discussion and their answers were analysed and summarised as discussed in the next section and in tables and figures showing evidence. In analysing the answers, this research adopted a method used for the observational study. Four students had similar responses to the first question. They said that their lack of use was because it was not compulsory (no motivation to use) and also because participation with blogging did not attract any score or grade towards the professional certification they were studying for (no performance expectancy). One of them added that he would prefer to look up on the internet for what he does not understand or ask friends rather than discuss or ask the teacher (facilitating conditions and social factors).

Two students said that participation should have been graded and scores added to their final grades for the module since they were studying to gain university credit (motivation and performance expectancy) which would have served as motivation for quality contributions. One student did not like the use of social tools for learning and he did not see himself using blogs in future or even using any social tool for learning. He still felt that it was not useful and that he preferred to read and understand rather than discussing with anybody and distracting himself.

In addressing the second question, five students suggested a phone app to make participation easy and quick.

These students suggested it would have been easier to blog with a simple app (ease of use) rather than an LMS. Blogging that would have been better on their phones (facilitating conditions) because accessing the LMS always on their laptop before posting a blog was not something that was interesting or exciting (motivation, facilitating condition and ease of use) and there was no motivation especially because it was not compulsory. Two students said that they did not know how to use the platform to access the blogs (prior knowledge) and one added that it was not easy to access the blog tool in the LMS (ease of use and facilitating conditions). They added that if they were guided on how to get to the blog tools in the LMS platform or how to use the LMS generally they would have been motivated. However, they were not bothered because it was not compulsory to participate.

The students were also bothered about support to encourage participation. Their views were analyzed and presented as they relate to the research constructs in Table 1 in order to provide an implementation framework.

Construct	Implication
Perceived usefulness	Give users reasons for online collaboration using Web 2.0 tools and also advise them of the usefulness of this participation in their learning processes.
Social factors	Organize students into small learning groups where they move together in learning with Web 2.0 tools and encourage each other to participate using interventions such as emails.
Motivation to use	Encourage students to engage in quality writing and ask them to collaborate with others by giving feedback to each other and participating in peer review.
Behaviour	Frequently check students' online activities and encourage them to use Web technologies to support themselves in their learning and to establish a learning network through the use of technologies.
Facilitating conditions	Ensure that users have access to institutional or personal ICT facilities. Also support users at different stages of learning activities with Web 2.0 tools when required.
Ease of use	Ensure platforms or Web 2.0 tools used for learning activities are reasonably easy and do not require extensive training effort to serve as motivation to users, and to enhance confidence for frequency of use.
Prior knowledge	Encourage or allow users to be familiar with the platforms or Web 2.0 tools before use in learning activities. Knowing how to use these tools will motivate frequent and effective use.
Performance expectancy	Help users to improve their performance by providing clear information on the importance of participation with Web 2.0 tools and the reward of participation which can be giving extra marks that would be added to their overall grade. This expectation of good performance in test assignments would motivate them to participation.

Table 1: Application of the Constructs in Implementation.

Question 3 was addressed in different ways and the researcher has analysed and summarized the students' views as they relate to the research constructs. This study yielded similar constructs unveiled in literature.

Discussion of qualitative study

After the implementation with blogs with 10 students who were registered to take Oracle Database and SQL in trimester three (a six weeks' programme), it was observed that there was still a low utilization of Web 2.0 interactive tools (group blogs) by students. The analysis also revealed the need for students to be guided at different stages in order for them to participate effectively.

However, the findings were in the evaluation of students' usage of the LMS. The students frequently accessed the LMS to download course content, lab materials but did not read the blogs or posted blogs neither did they comment on the blogs posted by the instructor.

The qualitative study unveiled repeated themes around eight constructs: ease of use, motivation, compulsion, training, guide, inadequacy of knowledge, relationship of the activities with their performance improvement, and support as mentioned by students (see Table 2).

Themes in interviews	Corresponding construct in survey
It is not compulsory	Motivation
Participation has no grades attached	Performance expectancy
It could be better with mobile app in mobile phone	Facilitating condition
It is not easy to use, it should be easier	Perceived ease of use
Like to share with Friends and work with others	Social factors
Not much understanding of learning by blogging	Prior Knowledge

Table 2: Interview themes and survey constructs.

The analysis also agrees with existing research (Venkatesh et al., 2003; Davis et al 1989; Ajzen, and Fishbein, 1980). The data provided suggestion with explanations on how these constructs can be applied to achieve increased adoption and improve the quality of learning with Web 2.0 tools were unveiled in the students' discussion and tabulated according to the constructs in the research (see Tables 1).

Stage 2 quantitative study

The quantitative study in previous study measured eight constructs: ease of use, motivation, facilitating condition, prior knowledge, social factor, performance expectancy and perceived usefulness. These constructs were hypothesized as factors that relate with the use of Web 2.0 in learning in higher institution. The constructs were operationalised in a questionnaire. Table 3 shows the constructs and the questions.

Constructs	Question	Question No.
Perceived ease of use	How easy do you find using these Web 2.0 tools (listed in question 6) to obtain the resources you need for your studies?	7
Perceived usefulness	To what extent do you agree that Web 2.0 tools would speed up acquisition of knowledge?	12
	To what extent do you agree that Web 2.0 tools will encourage active participation in learning?	13
Actual use	How often do you use Web 2.0 tools for academic purposes per week?	8

Social Factors	To what extent do you agree that the social part of e-learning platforms (e.g. Module and Blackboard) motivates the learners to achieve learning objectives?	10b	
Motivation	E-learning platforms enable you to send mails, download course materials upload assignments, read announcements, access the library material and discuss with other students, professionals and your lecturers. To what extent do you think such systems would motivate you to achieve your learning objectives?	10a	
Facilitating condition	Regarding facilities available for learning and teaching in the university, how satisfied are you? Add any comments regarding conditions necessary to facilitate Web 2.0 in learning.	4	
Performance Expectancy	To what extent do you agree that the use of Web 2.0 technologies for learning will help to improve performance?	14	
Prior knowledge	How often do you use Web 2.0 tools (e.g. blogs, Wikis, twitter) for social purposes per week?	6	
Behaviour intention	To what extent do you agree that social computing should be adopted in higher education and training for sharing of knowledge and information?	11	
Learning Satisfaction level	How satisfied are you regarding the teaching approach How satisfied are you regarding feedback How satisfied are you in your leaning activities or learning facilities	2 3 4	
Demographics	Gender	What is your gender?	16
	Status	Are you a student or lecturer?	1
	Field	What is your field?	19
	Age bracket	What is your age bracket?	17 18

Table 3: Operationalization of Constructs.

Data was collected from 270 participants (201 student and 69 lecturers) from 5 UK university

Quantitative data analysis

The data were analyzed and constructs were validated to answer the research question one. Table 4 shows the correlations of the independent variables with the dependent variable.

Dependent Variables	Independent Variable	Correlations Coefficients	Significance	Hypothesis
BI	PU (TAM)	.616**	Yes 0.01	H ₁

BI	SF (TAM),(UTAUT)	.674**	Yes 0.01	H ₂
BI	PK(Mine)	.625**	Yes 0.01	H ₃
BI	FC (UTAUT)	.130*	Yes 0.05	H ₄
BI	PEoU (TAM)	.221**	Yes 0.01	H ₅
BI	PE (UTAUT)	.620**	Yes 0.01	H ₆
BI	MtU (TRA)	.290**	Yes 0.01	H ₇
AU	BI (TAM),(UTAUT)	.155*	Yes 0.01	H ₈

Table 4: Correlation of Construct with dependent variable.

Table 4 shows that the all independent variables are significantly correlated with the dependent variables.

Stage 5. follow-up study

Unlike the preliminary qualitative study where the research features were not applied and challenges of engagement with Web 2.0 technologies and were experienced the follow-up study sensitised the lecturer on the research constructs and using a discussion forum, the class was introduced to the constructs and their implications. after this preparation, the students were given opportunity to use the tools At the end of the semester the students were asked their learning experience in a survey, 10 out of 25 students responded to the survey. Figure 3 shows their response of one question. To what extent do you agree that your learning experience has improved while using these tools?

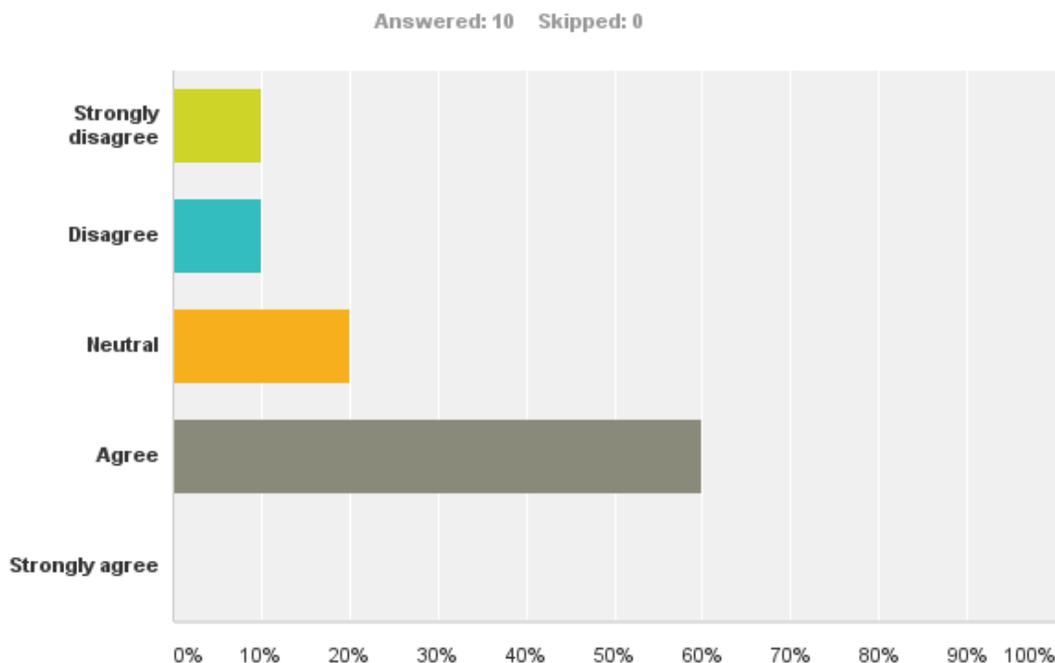


Figure 3: Students learning experience.

Figure 3 shows 60% agreed on the follow-up study that their learning improved using the discussion forum, 20% were neutral and 20% disagree. The students participated more than they did in the previous semester when there was no sensitisation.

6.4 Comparison of the Quantitative and the Quantitative Study

The qualitative and the quantitative data analyses agree in this research. The qualitative data confirmed the constructs in the conceptual model in the first phase of the research with explanation to understand how these constructs should be implemented and the quantitative data confirmed the constructs in the qualitative study. The follow-up study confirmed the findings of the two data analyses. Thus, the findings of the study developed an enhanced model of Web 2.0 acceptance as shown in figure 4.

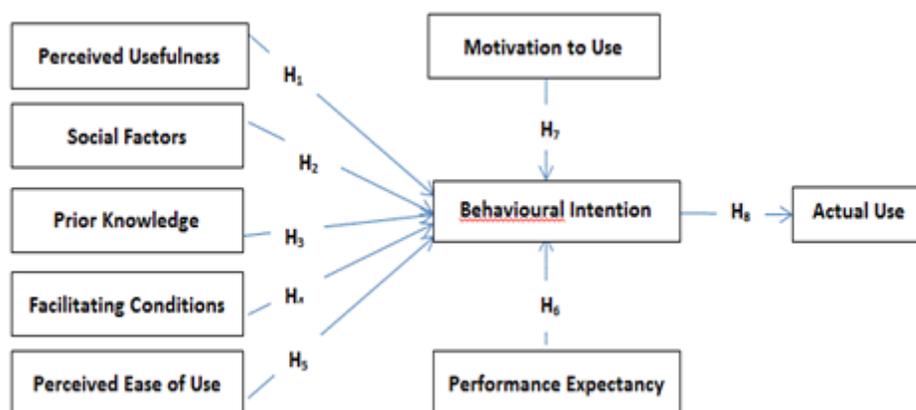


Figure 4: Enhanced model of Acceptance of Web 2.0 in learning in higher Education (Echeng, 2016).

FINDINGS

The qualitative data analysis revealed that technologies for learning activities need to be easily accessible and simple. Students need guidance on how best to use and where to find these tools in the platforms, e.g. Learning Management systems (LMS) especially if students are new to the systems. This agrees with the work in existing research (Redecker, 2011). The increased use of these tools for learning could be achieved when usage and participation is made mandatory. Adding grades or scores on participation and commenting on posts would also increase participation. Attitude towards use can be enhanced where there is awareness on the importance. There should be provision of training on how to use these tools for those not familiar with the tools, platform, or application. The tools or applications should be readily available online and an app offline to cater for those with limited internet facilities or poor internet signals.

The implication for practice from this study is that adequate measures need to be put in place to encourage students and academics to use Web 2.0 technologies for learning. This also agrees with Baxter et. al's (2011) research.

CONCLUSION

The quantitative data collected were analysed and it confirmed the constructs revealed in qualitative analysis. The findings reveal that the constructs (perceived usefulness, facilitating conditions, prior knowledge, social factors perceived ease of use, performance expectancy) significantly relate with behavioural intention to use Web 2.0 technology tools for learning. Behaviour intention in turn influences actual use of these tools for learning.

The qualitative results agree with the quantitative results and these were used to validate the research model. All the hypotheses of the model were validated in this research. An additional level of confirmation was the follow-up study.

The discussion with students revealed that more students attributed their lack of use to three problems: not being easily accessible, not being motivated, and not perceiving the usefulness. Some students needed to be guided on using these technologies for effective learning. The students who needed guidance were not familiar with the platform and with using blogs for learning. The researcher observed that the students frequently accessed the LMS to download materials but did not participate in posting blogs or commenting on the blogs posted by the lecturer and this was very surprising. The research also revealed that the students would be happier interactive discussion forums (audio, text and video). This research used its finding from combination of constructs to develop an enhanced model of acceptance and increased use of Web 2.0 technology for learning in higher education (see Figure 2).

This research should be replicated especially in other cultures to compare and contrast with current findings.

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