



Towards a faculty blended learning adoption model for higher education

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Abstract

Management of the Ghana Technology University College took the decision to adopt blended learning (BL) for teaching and learning because of its effectiveness as a learning approach. However, academicians are apprehensive about teaching in blended learning environment. A major study to understand the factors influencing faculty to adopt blended learning in the university has allowed a preliminary grounded theory model to be developed. This model identifies key factors, including pedagogy fitness, faculty technology affinity, student positive disposition to BL and institutional readiness lead positively to motivate faculty to adopt BL. The outcome of this research is a faculty blended learning adoption model which highlights the process of how faculty members situate themselves within the construct of adoption. Furthermore, the study highlights that faculty blended learning can be understood through the lens of motivational theories of hygiene and the competing internal and external environmental priorities that faculty must construct and define in order to adopt blended learning.

Keywords Blended learning · Faculty blended adoption model · Constant comparative method · Higher education institution · Developing countries

1 Introduction

In the past few decades, there has been increase in the number of higher education institutions (HEIs) implementing blended learning (BL) approaches (Taylor and Newton 2013). BL is the utilization of computer- supported collaboration and communication tools (emails, forums, etc), self-paced learning tools/materials (websites, online resources etc) and learning management systems in conjunction within house teaching

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practices by higher education faculty (Ocak 2011). These tools have allowed universities to move away from the traditional face to face education to blended education (Bohle et al. 2013). BL is predicted to be ‘the predominant educational model’ going into the future (Moskal et al. 2013). BL increases faculty and learner satisfaction, provides reach and access to students, convenience, cost efficiencies, accessibility of information, universal connectivity, promotes rich and effective learning experiences and improves learning outcomes (Mouakket and Bettayeb 2015). Blended learning seems to be the preferred teaching approach comparatively to face to face or fully online instruction by faculty members in HEIs (Oluniyi and Taiwo 2016).

One of the key stakeholders in any effective integration of technology in teaching and learning is the teacher (Teo 2011). Thus, the extent of their willingness to adopt technology largely determines the success of any institutional wide implementation programs (Teo 2011). Development and implementation by the users (academics) present several challenges that need to be investigated in order for BL to achieve its full transformational potential ((Sexton et al. 2016), (Garrison and Kanuka 2004) since issues arise when faculty members transition from traditional face to face teaching to teach in blended mode as a result of the alteration of the teaching environment and the complex dynamics that affect the role of the faculty (Ocak 2011).

Research has gone into examining the perceptions, experiences and barriers why academics do not adopt BL (Stoffregen et al. 2016). For example, in a Turkish higher education institution (Ocak 2011) investigated why faculty were not adopting blended learning and found that lack of institutional support, complexity in instruction and the difficulty of adoption of new technologies were among the reasons for faculty lacklustre attitude towards BL adoption.

Blended learning systems are reckoned to be effective and efficient when deployed for teaching and learning (Sexton et al. 2016).. The barriers affecting BL adoption by faculty include amongst others, inadequate technical support, and inadequate faculty capacity (Antwi-Boampong 2018). Overcoming these barriers so that the focus is more on the pedagogical dimensions should be the focus of administrators in HEIs (Radif et al. no date).

In a study of barriers impacting faculty adoption of online learning systems in twenty-two universities in the united states of America, (Bacow et al. 2012a, b) found that while technology enhanced learning was increasing, scepticisms surrounding it still existed. In a qualitative case study, (Bacow et al. 2012a, b) reviews the basis of the scepticism and concludes that online education was alien to many faculty. Among some of the barriers the study identified included anxieties and fear that online education will diminish faculty ranks and the initial higher investment of time by faculty teaching online courses than teaching the same course in a traditional format. In another study, (Radif et al. no date) examined the experiences and barriers affecting faculty members in an Iraqi university and concluded that 'lack of or limited teachers' training; lack of commitment to constructivist pedagogy; lack of experience to use the technology; lack of technical support; lack of pedagogical training for teachers; and lack of appropriate educational software' were the main barriers affecting faculty BL adoption.

Studies on BL adoption has largely focused on examining barriers to adoption (Ssekakubo et al. 2011), investigating perceptions of students (Mtebe and Raphael 2018), identifying critical success factors (Alhabeeb and Rowley 2018) and developing institutional drivers of BL adoption (Porter et al. 2016). However, there is limited

scholarship on BL adoption models or frameworks that are developed out of the lived and teaching experiences of faculty members (Taylor and Newton 2013). Where they do exist, they are mainly studies from developed country perspectives (Teo 2011). Studies on BL adoption from developed countries perspectives remain largely anecdotal (Tshabalala et al. 2014).

This article presents current findings of an ongoing study that identifies factors influencing BL adoption in a Ghanaian university and how these understanding inform the development of a faculty BL adoption model in this university. The following research questions guides the study: What factors influence faculty to adopt BL and how does this understanding inform the development of a faculty blended learning adoption model?

The rest of the article is structured as follows: Section 2 reviews existing literature on faculty BL adoption in HEIs. Section 3 describes the research method used for the study. Results and discussions from the study are then presented alongside a grounded theory framework detailing the adoption experiences of faculty, lessons learnt, and future research directions in Sections 4 and 5 respectively.

2 Literature review

There has been extensive research into faculty blended learning adoption in higher education since the 2000s (Garrison and Kanuka 2004) (Kasse et al. 2015). Outcomes from these researches have helped to identify the key concepts, constructs and core themes related to how faculty adopt blended learning (Hoffman 2013) (Kasse et al. 2015). Different existing theories and models have also been used to understand factors which influence faculty BL adoption. The most frequently used ones in recent studies include the Technology Adoption Model, Davis (1989) and Theory of Reasoned Action, Fisbein and Ajzen (1975) and the Unified Theory of Acceptance and Use of Technology (UTAUT) model, (Vanketash et al. 2003).

The Technology Acceptance Model (TAM) was developed by Davis (1989) and has since its development been applied as the most commonly used model in technology acceptance studies. According Davis (1989) the user's attitude towards technology is mainly influenced by the following factors: perceived usefulness and perceived ease of use. Using self-reported data gathered from 592 teachers, Teo (2011) used TAM constructs to develop a model that statistically explained teachers' intention to integrate technology in teaching and learning. Using structural equation modelling, the following attributes: perceived usefulness, perceived ease of use, subjective norm, facilitating conditions, attitude towards use and behavioural intention to use technology were tested for model fit. Results revealed that eight of the constructs were supported except for subjective norm.

Theory of Reasoned Action, Fisbein and Ajzen (1975). The model of accepting technology has its foundations in the theory of social psychology, developed by Fisbein and Ajzen (1975) as Theory of Reasoned Action (TRA) which points out key factors influencing the behavioural intent: attitude toward behaviour and subjective norm; if users have the intention of accepting technology, they will do so, but under the strong influence of the environment. Venkatesh et al. (2003) developed the Unified Theory of Acceptance and Use of Technology (UTAUT) model which is also very often used in

the field of e-learning. According to Vankatesh et al. (2003) four factors influence the user's technology acceptance, namely: performance expectancy, effort expectancy, social influence and facilitating conditions. The model emphasizes the importance of four moderators: age, gender, experience and voluntariness of use, as individual differences between users towards technology acceptance. (Sarjoo and Fraser 2014), used the UTAUT model to explore the factors that determine the level of instructors' acceptance of the e-learning platform at the University of the West Indies (UWI), St. Augustine Campus. Evaluating the responses of over 600 instructors three of the four factors emerged as significant; facilitating conditions, perceived ease of use and perceived usefulness except for subjective norm.

Using Mezirow's Transformational Learning Theory (Mezirow 1997) as the theoretical framework, Harena et al. (2011) reports the adoption of blended learning among academicians in Malaysia. The study found a very low BL adoption rate of only 13% of the academics adopting the learning approach. The academics identified perceived usefulness of the system, learning goals, and educational technology preference as influencing their decisions to adopt BL. (Shaour 2014) interviewed five faculty members to investigate their views towards BL and found that using blended learning is beneficial and assisted teachers in their performance. Internet self-efficacy, structural factors, and perceived usefulness were all associated with the uptake of learning technologies among higher education faculty.

(Moser 2007), proposed a faculty educational technology adoption cycle with the time faculty members spend integrating technology into their teaching being at the core of this model. (Moser 2007) identifies a set of faculty behavioural activities that faculty execute daily and argues that these behavioural activities are influenced by several factors and conditions within the educational context. To this extent, (Moser 2007) theorises that as these behavioural activities and external factors interact to engage faculty attention, the element of time which is scarce becomes the core construct which determines whether faculty would integrate technology into their teaching or not.

Substantial literature has reported on the adoption of blended learning from academics' points of view using Grounded Theory (Charmaz 1996). A study was undertaken by Martins and Baptista Nunes (2016) which focused on investigating how academics enact trust in e-learning through an inductive identification of recognizable risks and facilitators engaged in the practice of e-learning assimilation, using higher educational institutions as case studies. The study adopted the Grounded Theory as the main methodological tool to undertake a standardized analysis of the data gathered from respondents and are assembled in semi-structured format from interviews undertaken from 62 academics. Following the constant comparative method, (Constant et al. 2016) the results were analysed based on its three staged coding approach: open, axial and selective coding. The study found that individual change and integration by mutual understanding and institutionalization are detailed as the processes through which the challenges of e-learning adoption could be overcome.

There are also other several proposed blended learning adoption frameworks and models in literature. Among them are Khan's Octagonal Framework (Khan 2002) and its extensions (Elameer and Idrus 2010)(K. 2010). The framework has eight dimensions: institutional, pedagogical, technological, interface design, evaluation, management, resource support, and ethical. Each dimension in the framework represents a category of issues that need to be addressed. These issues help organize thinking, and

ensure that the resulting learning program creates a meaningful learning experience (K. 2010). Also, other BL institutional frameworks exist such that guide transitions into enhanced BL in HEI (Adekola et al. 2017).

There is limited research on faculty BL adoption even though the outcome of such research will benefit HEIs to strategically implement BL (Porter and Graham 2016). Whilst previous studies looked at theoretical, pedagogical approaches, or specific aspects of faculty adoption research (e.g. faculty's perceptions, facilitators and barriers), there are no comprehensive theories to inform how the various elements of BL adoption such as design, implementation and delivery can be understood and optimised (Newton and Ellis 2006).

The concepts and models from these studies are difficult to tie down and replicated as a result of the environmental context in which they are developed. However, this study proposes that rather than applying constructs from theoretical models to test faculty BL adoption it is more relevant to develop theory/model out of the experiences and perspectives of faculty teaching in BL mode in a university.

Founded in Accra in March 2005 Ghana Technology University College (GTUC) is one of the most prestigious universities in Ghana. There are three faculties and a graduate school, namely, faculty of engineering, faculty of computing and information systems, faculty of I.T business and a centre for online learning and teaching (COLT). As at June 2019, the university had a student population of about 6700 and a faculty/staff strength of about 430.

The blended learning design at GTUC is the type practised at the class level, that is, blended learning focused on class activities, by implementing the on-line solution to enhance the face-to-face sessions in most of the cases. Essentially, teaching and learning practices is made up of two parts: learning inside and outside the classroom. Courses are available via a robust learning management system (LMS) in order to provide support and enhance after-class, online interactions for instructor–student and student–student communication. Students had to finish their on-line activities before the face-to-face sessions so they would be well prepared for the on-site activities. Faculty members ensured that courses are blended with face-to-face and on-line sessions for about 30–70 of the course.

The blended learning described above was implemented after the university management developed a policy framework to introduce BL under non-compulsory usage in both undergraduate and graduate programs at GTUC. Among the objectives was to train selected faculty in BL instructional methods and upscale the teaching method across the university by 2021. Sadly, notwithstanding the huge investments in acquiring a learning management system, training and recruiting an instructional technologist meanwhile the widespread adoption of BL that was envisaged is yet to be achieved.

3 Methods

An abundance of scholarship exist which proffer different faculty adoption models with view of evidencing what can be regarded as the better method to facilitate successful transitions from face to face teaching to blended teaching and learning environments. However, in the majority of most of the cases, these studies have been underpinned by theory testing or validating theory. To this extent, the methods are often questioned.

With insufficient studies with enough theoretical basis to use to form hypotheses, as the literature review found, an inductive Grounded Theory (Glaser and Strauss 1967) approach was selected as the appropriate methodology on which to base this research. To gain a depth of understanding of the social phenomena and processes influencing BL in the organisation, qualitative research methods were used.

This study takes the stance that although it is the case that BL adoption research has largely been carried out using deductive methodological approaches to develop models like the technology adoption model (Fathema et al. 2015; Fathema and Leigh Sutton 2013; Teo 2011) there exists a strong movement towards the importance of authenticity, the adoption of socio-cultural models of learning and the prevalence of practitioner-based evaluation. Based on this argument thereof, this researcher employs an inductive Grounded Theory (GT) methodology (Glaser 2017) for this study as it is a well-grounded inductive research process which leads to the development of theoretical concepts and categories (Newton et al. 2006) unlike models developed deductively and tested for their internal validity in limited context and environments like TAM, Davis (1989) and TRA, Fisbein and Ajzen, (1975). (1975. Also, GT is most suited to areas of research which have not been explored in detail before, so therefore, given that the research on faculty perception and experiences as they adopt BL in HEIs in Ghana is limited, GT is most appropriate.

A two stage qualitative data collecting approach was adopted;

1. The first phase was to interview fifteen faculty members out of forty-one academic staff members from the Faculty of Computing and Information Systems. Interviewees were identified through purposeful sampling (Creswell and Miller 2000) and mainly targeted faculty members who were trained and certified to teach in BL mode by the university's Centre for Online and Learning and Teaching (COLT). This was to identify factors that influenced or impacted on their BL adoption. Faculty selected for the study had taught blended courses administered through a Moodle platform. (See Appendix Table 3 for faculty demographics).
2. In the second stage, we compared the emerging factors from stage one with those in existing articles and surveys in the literature of faculty BL adoption experiences to further develop the emergent factors started from stage one.

Stage two was to find existing articles and surveys from other universities that could offer confirming or disconfirming evidence for the results from the research case study emerging from stage one. The intention also was not to use results obtained from the data analysed from the articles to test the emerging model/theory in stage one but rather as a comparative approach that adds insights to the research by way of helping to understand what the emerging theory of faculty experiences in stage one meant relative to finding support in literature, extend the work of others or possibly to discover new insights in the field.

3.1 Stage one-interview data collection

With the assistance of a Faculty Program Manager, fifteen faculty members were interviewed. Seven faculty members were initially selected and interviewed between November 2017–January 2018. The interviews begun with

seven faculty members and were coded immediately to gain insights into the experiences of faculty. The insights gained from the initial interviews provided new information to the interviewer to inform follow up questions with eight other additional faculty who all had a record of teaching blended courses at the Faculty of Computing and Information Systems (FCOIS) of GTUC. Interviews were discontinued when theoretical saturation was reached with no new insights and concepts emerging from the data.

Each interview was approximately an hour long and focused on the participants' experiences of teaching in blended mode, the challenges faced, and the strategies used to overcome them. Comprehensive notes were also taken during interviews to capture non-verbal cues. The interview questions were data driven and were modified to suit emerging concepts as the data matured. In strict accordance to (Glaser 2017), there were no preconceived questions as questions could emerge from the data (Glaser 2017). The interviews were first voice recorded and transcribed and immediately coded into theoretical concepts and categories using NVIVO (2012) which is an analytical software research tool in consonance with the dictates of the constant comparative analytical method (Glaser and Strauss 1967).

3.1.1 Literature stage

The literature search followed a theoretical procedure of literature review recommended by Hemingway and Brereton (2009). Studies or reports for inclusion were assessed for their quality. Findings from individual studies or reports were synthesised in an unbiased way and interpreted. Findings are presented in a balanced and impartial summary with due consideration of any flaws in the evidence (Zhang and Zhu 2016). Thus, searches were conducted from online sources such as google scholar and academic libraries and repositories, using titles such as blended learning, faculty BL experiences and faculty blended learning adoption. In all 103 published and unpublished evidence were found out of which 24 were selected as relevant that could offer a disconfirming or confirming evidence for the theoretical framework developed in stage one.

Despite searching for refereed papers, the ones the researcher found were largely anecdotal accounts of faculty BL experiences from universities in developed countries. Also, the articles we found were biased towards deduction and theoretically inspired to test theory or extend same. Whiles acknowledging these geographical and theoretical biases, these articles nonetheless provided good data on the faculty's experiences and factors influencing or impacting BL adoption that could informed analysis and helped shaped model development. (See Appendix Table 3 for table of literature reviewed).

The same research questions used in opening the field data were used in approaching the articles, 'What are the factors that influence faculty to adopt blended learning and how do these inform model development?'. Data collection finished when no new insight was being generated or added to theoretical concepts and categories. To be precise, these articles were conceived as interview subjects for which questions in line with the research questions were asked.

3.2 Data analysis

The researcher used the constant comparative method of GT as developed by Glaser (1967) for the analysis. This method is used to systematically analyse qualitative data by constantly comparing the data using explicit and analytical procedures (Charmaz, 2000; Strauss and Corbin 1990). The lack of existing theory to explain experiences of faculty involved in adopting BL for teaching and learning and a conceptual model grounded on their experiences made grounded theory an ideal method for this study.

The grounded theory process consists of four stages: the derivation of codes, concepts and categories and merging the codes to discover emerging concepts. The researcher began by first conducting a line by line open coding of the interview transcripts. There were lingering doubts as to what a code was/is/should be, and so the researcher had to consult literature for clarity. The researcher found out in the literature that coding should be performed with an open mind without preconceived ideas. Glaser (1990) insisted that preconceived ideas should not be forced on the data by looking for evidence to support established ideas and so in this case the codes were not identified a priori; rather they emerged from the data and were continually compared and redefined throughout the analysis process. Theoretical saturation was reached when no new insights were being provided for the theoretical categories, including the core category. It then suggested that it was time to stop data collection and to reflect on the theoretical development which required reflection and refinement of the categories and their relationships to develop the model.

For reliability and validity purposes, an external coder was consulted to open code by a random selection of five interview transcripts to verify open codes and emerging concepts and categories. The external coder was a post-doctoral fellow from GTUC with experience in conducting grounded theory research. In general, the external coder's codes matched ours albeit there were minor variations in codes. These minor differences did not seem to affect or change the overall emerging themes or outcomes. Nonetheless to resolve these minor differences, a meeting was held between the researcher and the external coder to discuss these differences to reach agreement on the outcome. A detailed research diary was kept allowing opportunity for tracing and replication of the research. The constant comparison analytical method used is explained in detail in section four.

4 Overview of interviews

Interview respondents that were selected for the research at GTUC provided their demographic information including sex, academic qualifications and departments. All the 15 interviewees were faculty members teaching involved in blended teaching mode since 2013. These 15 were purposively sampled with the assistance of program managers out from a total of 41 faculty that had undergone training at the Centre for Online learning and Teaching of GTUC.

The interview guide developed in line with the main objectives are as follows:

- Describe how you teach in BL mode and why do you use this approach, and do you think this approach is successful with this course?

- How does teaching in BL mode contribute to achieving your intended learning outcomes?
- Do you feel your level of technology proficiency is adequate to teach BL?
- Explain how teaching BL mode help you and the students learn more effectively than the face to face?
- Describe the institutional support given you to teach BL?
- Explain what influences you to teach in BL mode.
- What are the main challenges you and your students struggle with in BL?

Interview respondents identified the extent to which the institutional arrangement within which the adoption process evolves influences or impacts their decisions to reject or accept BL for teaching and learning delivery. Table 1 provides a summary of their responses. The overall result teased out from the interviews presents a dichotomy of issues that faculty are confronted with. The responses indicate there exist positive motivational and negative motivational predisposing factors that interplay within the institutional environment. The positive motivational factors include factors such as the technological affinity of faculty, student positive disposition to BL, institutional readiness and pedagogy fitness. For the latter, factors such as the non-readiness of the institution to implement BL, students' negative disposition to BL, BL technological incompatibility and pedagogy incompatibility were found as demotivators impacting faculty decisions to adopt BL.

For example, for the positive motivating factors, respondents indicated that the positive disposition of students to accept teaching in a BL goes a long way to influence them to adopt BL. All the respondents reported issues that would significantly influence their decision to adopt. Adding further, the respondents mention the need for the institution to provide the necessary infrastructure, institutional support, and the commitment from top management in pushing the BL implementation agenda. This formed the institutional readiness category and captured as quoted by one respondent as thus 'the computers laboratory and not only that the internet facilities must be adequately provided'.

Similarly, the respondents highlighted factors that related to the non-readiness of the institution as affecting their adoption decisions. These include issues that related to inadequate institutional support, poor management problem solving skills and lack of relevant personal among others. Remarks by a respondent such as 'to the best of my knowledge no policy exist' and 'there was no consultative process involving faculty before the introduction'.

All the respondents did agree that BL made teaching easier, and that there was simplification of task using learning management system platforms. To which extent, they did perceive the learning management system platform to be a useful platform. Expressing this, one respondent said 'uploading lecture material made my work easier and helped students to lean in advance of class' another said 'I use it to stimulate students learning y posting question on the forums'. The quotes of respondents analysed form the transcripts are provided in Table 1.

4.1 Analysis process using grounded theory

The constant comparison analytical process (Glaser 2005) is presented in this section to detail the process used to generate the results from open coding until the theoretical

Table 1 Faculty BL analysis

Key point	Interview quotes	Unique open codes	Concepts	Categories
1	Fortunately for us we the students have access to a Wi-Fi and are serious about accessing the Internet	Potential student interest	Acceptance potential of students	Institutional readiness
2	it reduces the educational expenses for the students	reduced learning cost		
3	majority of the class have their own laptop and so the few that do not have the laptops could borrow	availability of access equipment for students		
4	am advancing quickly and the same applies to the students' transition	student acceptance		
5	They sit in their offices they have internet connectivity so they able to interact online	perceived usefulness for students		
6	Students like the blended learning approach	personality of students	Resource availability	
7	even offer training for anyone in country and out of country who wants to take any training on learning management system through the center of online learning and teaching	institutional support		
8	So institutionally the institution is helping us in that aspect but we're having challenges	positive institutional push		
9	I think the peer education and experience sharing is also a factor that is helping most of us to do it	peer recommendation	Faculty-technology affinity	Faculty-technology affinity
10	Yes, there is change management going on	Faculty agreeableness		
11	It is inevitable that teaching and learning can, should, must, will be supported by technology	Personality of faculty		
12	I have been doing this quiet a bit before I get here so I'm kind of used to doing it already so erm...	Previous faculty experience		
13	Feedback from students was greatly improved	task simplification	Pedagogy fitness of BL	Pedagogy fitness of BL
14	Blended learning provides support to the task of teaching	task aid potential		
15	Faculty can simulate offline teaching experience, online	task compatibility		
16	Platform is efficient	platform stability		

Table 1 (continued)

Key point	Interview quotes	Unique open codes	Concepts	Categories
17	Platform supports flexible continuous education for adults	perceived usefulness of platform		
18	the students initially they also had challenges because some were freshmen	student and platform unfamiliarity	Student negative disposition to BL	Student negative disposition to BL
19	we know that the students usually until they are forced are not very.... they are very reluctant in using the online platform	student reluctance		
20	some are used to the normal classroom system so transition to the online is a problem	student apathy		
21	these students cannot have access to the tools that we are using online and it means that this will even go a long way to discourage the lecturer himself	learning complexity		
22	Some students can't afford access equipment's	economic situation of students		
23	On the side of the institution, I'll say is not something that they've communicated well to the students	poor student orientation		
24	If I upload all my material online, who has the right or authority to those things once they are online'	lack of sense of control	BL – pedagogy incompatibility	BL – pedagogy incompatibility
25	I think due to the challenge's lecturers were doing double work	task complexity		
26	There were instances where faculty will post materials online and students will not be able to access it	task incompatibility		
27	the way it is being implemented.	faculty exclusion		
28	the challenge in the system management is that only receives reports from may be manager are the administrators of the system.	poor operational strategy	unacceptable change management process	Institutional unreadiness
29	No, it hasn't done so well. There a lot of reasons for this but chief aim among them is that the policy wasn't thought through fully	poor implementation strategy		
30	We had training on two or three occasions on how to use the module. Last two years we had another program with Coventry.	previous poor institutional strategy	Institutional unreadiness	Institutional unreadiness
31		negative institutional push		

Table 1 (continued)

Key point	Interview quotes	Unique open codes	Concepts	Categories
	So, at a point certain group of people were given the mandatory to just have our courses online			
32	Is not available we have to ask for and we are not too sure. What we got was it because we were told is being revised	no institutional roadmap		
33	lacking the requisite IT problem solving skills	Management poor problem-solving skills		
34	We need labs the can demonstrate the blended learning approach more then you have the tools,	inadequate institutional support		
35	Institutionally we lack logistics, infrastructure itself has a little or the weakness so to speak	lack of requisite personnel		
36	Initially it was a little challenge because we had connectivity issues	poor access connectivity		
37	In balance between online and offline timetable	Poor timetable management		
38	I think the best is to reduce class size	Over-populated class size		
39	For me for instance the school's Internet is always extremely slow	poor user experience		
40	some of the student were not using it because any time they go either they unable to access it even they access it was too slow	platform inadequacy	BL technology incompatibility	BL technology incompatibility
41	Some contents produced by faculty cannot be retrieved	poor content archiving		
42	I have fears as well because you are doing everything online even the grade your records online internet security and all those things cyber security you are not too sure it could be change since there is no back up	data breach concerns		

Source: field work, Antwi-Boampong (2019)

categories were identified. However, owing to the impossibility to summarize the entire analysis in a single paper, this section presents an example of how coding, through concepts and categories were arrived at working from the interview transcripts all through to the emerging theory.

The researcher started by assigning unique codes to text in the interview transcripts through a process described by Glaser as open coding (Glaser 2005). Through this process, there were over 200 codes that were generated from the transcripts, however, only 42 of the codes were relevant for this research. These are listed as unique open codes in Table 1. Consistent with grounded theory (GT), codes that were opened coded were constantly compared looking for connections and similarities. For example, in Table 1, we compared key point 1 to key points 2,3,4,5,6,7 and 8. These are: K1. Potential student interest, K2. Reduced learning cost, K3. Personality of students, K4. Perceived usefulness for students, K5. Students' acceptance, K5. Reduced learning cost, K6. Availability of access to equipment to students, K7. Institutional support, K8. Positive institutional push.

4.2 Emergence of concepts

It can be seen from the characteristics of the above key points that their commonalities relate to the availability of institutional resources and factors which in the conceptualisation of faculty made students accept BL. We thus conceptualized these by grouping them into higher order concepts called resource availability and acceptance potential of students. Thus, establishing them as concept 1 and 2 respectively.

The other key points and unique codes were treated the same and grouped together to form the following additional concepts:

- Concept 3- Faculty technology affinity emerged from key points K9-K12
- Concept 4-Pedagogy fitness of BL emerged from key points K13-K17
- Concept 5- Student negative disposition to BL emerged from key points K18-K23
- Concept 6-BL pedagogy incompatibility emerged from key points K24-K26
- Concept 7-Institutional non-readiness emerged from key points K29-K39
- Concept 8-BL technology incompatibility emerged from key points K40-K42

4.3 Emergence of categories

Reflecting on these eight concepts, it became apparent that some of them had similar characteristics and bore commonalities that could be grouped together into higher order levels called categories. Still using the concepts of resource availability and acceptance potential of students which were derived from key point 1 to key point 8, it was realised that these concepts related to institutional readiness. The readiness to provide the environment for students to accept BL and to provide the resources faculty need are an institutional one. Therefore, two concepts were assigned to the category of institutional readiness.

This said, the same was done for the other concepts and by doing so the following categories came from the data analysis: Institutional readiness; Faculty technology affinity; Pedagogy fitness of BL, Institutional non-unreadiness; Student negative BL disposition, Student positive disposition, BL technology incompatibility; and BL pedagogy incompatibility.

4.4 Sorting

Once we reached saturation with the data, we began to sort out the memos that we had written in order to put the fractured data back together. According to Glaser (2005), the process of sorting puts fractured data together and therefore recommends to the researcher to sort ideas and not the data. At this stage, we proceeded to sort out the memos at a conceptual level and this resulted into the outline of the emerging theory in terms of how the different categories related to the core category.

In order to generate the outline of the theory we printed out our memos and arranged them according to the topics so that the related topics formed coherently. It took a month to shuffle the memos around and conceptualising the relationships between the memos to find out the order which addressed our research questions. The researcher then proceeded to draw out these relationships between the categories with a pen on paper only stopping when a diagram that clearly established how the concepts and categories related emerged.

4.5 Theoretical coding

Theoretical coding is defined as “the property of coding and constant comparative analysis that yields the conceptual relationship between categories and their properties as they emerge” (Glaser 1992). With this at the back of our minds we conceptualized how the categories related to each other as a hypothesis to be integrated into the theory (Glaser 1992). Following Glaser’s (1992) recommendation, we compared our data to what the faculty were saying in relation to adoption. It emerged to the attention of the researcher that the data mirrored faculty motivation confirmation factors to either adopt or reject BL (see Table 2). Having done this, the researcher proceeded to link the seven categories to the core category i.e. motivation by conceptualizing their relationships to each of the categories and eventually linked them together to develop the Faculty BL model (See Fig. 4, for FBLAM).

4.6 Write up

The final step was to write up the emerging theory by following the outline of the framework generated as a result of sorting and theoretical coding. Our theory thus revolved around faculty self- motivation or demotivation factors which lead faculty into adoption of rejection of BL. In consonance with GT, once the findings were established, we then reviewed the literature on faculty motivation in order to relate the findings to the literature through the integration of ideas (Glaser 2005).

In the literature review for stage two, the researcher looked at several papers (Ishak 2018; Abdullah Alhabeeba Jennifer Rowley 2018; Antwi-Boampong 2018) which provided insights into faculty perspective on BL. The findings from these papers shows that blended learning implementation can improve quality in higher education and has potential to improve teacher education.

Table 2 Theoretical coding to derive the core category or concern

Propositioning factors for and against adoption	Categories	memo	Core category	Hypothesized relationship with core category	Eventual outcome
Factors for	Institutional readiness	These attributes will influence the behavior of the faculty leading to a motivation. Motivation is the common theme	Motivation confirmation	Positive motivation towards adopt BL	BL adoption
	Faculty-technology affinity				
	Pedagogy fitness of BL				
From selected code of student data	Student positive disposition to adopt BL				
Factors against	Student negative deposition to BL (like student data)	These attributes kill the motivation. Motivation is the common theme		Negative Motivation towards adopt BL	BL rejection
	BL – pedagogy incompatibility				
	Institutional unreadiness				
	BL–technology incompatibility				

Source, field work, Antwi-Boampong, (2019)

This notwithstanding, additional papers (Fatheema and Sutton 2013; Usagawa 2017; Carbonell et al. 2013) find technical challenges, organizational challenges and system design flaws as barriers to faculty BL adoption (see Appendix Table 3). Comparison between the literature findings and the interview findings confirmed the importance of our findings. It revealed that our factors are not only relevant to faculty at GTUC but also important in other HEIs. The results thus are well grounded in the data as well as with conformation from the literature.

Eight main categories were identified as the outcome from the analysis of the interview transcripts and the articles relative to what the faculty members adoption experiences at GTUC were. These were: Institutional readiness; Faculty technology affinity; Pedagogy fitness of BL; Institutional non-readiness; Student negative BL disposition; Student positive disposition, BL technology incompatibility; and BL pedagogy incompatibility (see Table 1). This paper does not present the full analysis of the connections between the categories and the concepts due to the limitation of space. This can be obtained on request. Tables 1 and 2 present the details of concepts and categories derived out of the analysis.

Finally, to a large extent there was confirmation of the faculty adoption categories with the which were compared. Where minor differences existed, they applied to the mind of the researcher in ways which added rich conceptual insights into arriving at the

theoretical categories arrived at. The differences between the data and literature where they exist would be highlighted and discussed in the next section. Secondly, the results represent outcomes that are firmly grounded in the data and reflect the factors that shape how faculty members adopt BL within the construct of adoption. Underpinning these outcomes is the core category of how faculty motivation relates to these categories. Finally, this study identified several categories and concepts that were important for faculty to adopt BL in HEIs and hypothesises them to provide a useful faculty blended learning adoption model that can be tested in further research.

4.7 Model development

This section explains how the FBLAM was developed and how it can be applied. The FBLAM was developed around the core concern or category that was identified during the GT constant comparison process. According to Glaser (2004) the core category ‘appears to account for most of the variation around the concern or problem that is the focus of the study’ (Glaser 2004). It took a considerable amount of time to refine and articulate the core concern of the respondents. It was evident that the influence of technology, students’ disposition to BL, pedagogy and institutional readiness were important to the respondents and that their decision to adopt BL was a function of how positively these factors played out within the given circumstances. Based on these eight main concerns (categories), we theorised the core concern of the respondents relative to adopting blended learning to be that of motivation.

To this end, the eight main categories were conceptualized and grouped into negative and positive motivation factors. Four of these constructs were conceived to positively lead to influence and confirm faculty motivation to adopt BL. The overlap and interactions between them and the core concern were used to inform the development of the model, which is presented in Fig. 1. Based on this, we propose the Faculty Blended Learning Adoption Model (FBLAM) with motivation as the core concern influencing faculty technology adoption which is influenced by several outside factors (institutional and individual). A relationship was drawn between the positive motivation factors and how depending on

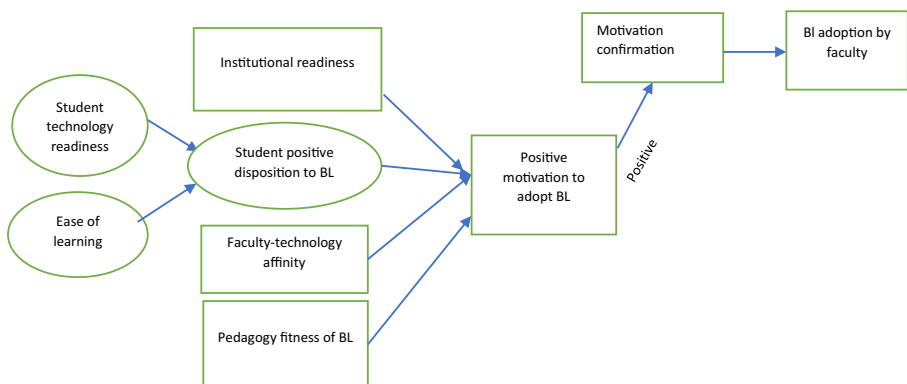


Fig. 1 A faculty BL adoption (FBLAM) presents the outcome of the hypothesised relationships between the categories and the core category

their relative strength within the mix of factors should lead to motivating faculty to adopt BL.

Therefore, a faculty blended learning adoption model requires a positive stimulation of motivational factors that is required to lead to a positive motivation confirmation by faculty in order that they adopt BL. This requires management to provide the requisite institutional support mechanisms, resources, infrastructure as well as aligning learning management platforms with compatible pedagogic resources that supports learning to encourage effective teaching delivery.

Each of these factors was interrelated and contributed to how respondents were internalizing BL activities relative to their contemplations of what the requisite factors necessary for adoption ought to be. The following discussion and theoretical development are very firmly grounded in the respondents' perspectives. The comparative analysis of emerging themes is grounded in the literature sources obtained in stage two of the data collection phase. Questions for further research resulting from this model are also provided.

The proposed model is derived from the constant comparative process which broke down the data into codes, concepts and categories until theoretical saturation. Axial coding of these categories yielded four key independent constructs; Pedagogy fitness for BL, Faculty technology affinity, student positive disposition to BL (with two accompanying dependent sub constructs) and institutional readiness. Within the context of these constructs, the author abstracted that these set of independent factors interact and interplay in ways that when influencing positively faculty are motivated to adopt BL for teaching and learning. Thus, motivation is positively constructed as the emergent core category which leads faculty to adopt BL.

5 Discussions

In existing literature, factors influencing faculty satisfaction tend to be classified as intrinsic vs extrinsic, motivating vs inhibiting and/or promoting satisfaction vs promoting dissatisfaction (Schifter 2000). Cook et al. (2009) classified factors as intrinsic or extrinsic and investigated the impact those factors had in contributing to the motivation or inhibition of experienced online faculty to continue teaching in the online education system. Intrinsic factors included desire to help students, opportunity to try something new, intellectual challenge, personal motivation to use technology, overall job satisfaction, the ability to reach a broader student audience and the opportunity to improve teaching. Extrinsic factors included release time, support and encouragement from institution administrators and departmental colleagues, merit pay, monetary support, technical support provided by the institution, workload concerns and quality concerns.

This study showed that intrinsic factors positively contribute to ongoing and increased motivation to participate in the BL while failure to adequately address extrinsic factors can be found to contribute to greater inhibition to participate in the BL. (Moskal et al. 2013) assert that BL can be pervasive and has the potential to disrupt institutional

process. Cited to be a dangerous idea (Moskal et al. 2013), institutions intending on implementing blended learning should assess its technology readiness and avoid top down implementation strategies (Gautreau 2016). A more consultative process that involves faculty to get their buy into the process is reported (Basak and Govender 2016). Often, faculty have reported lack of consultations, the absence of institutional policy frameworks that outlines and guides BL implementation. Without faculty engagement, in fact, any initiative to adopt a blended learning approach is likely to fail (Christo-Baker 2004). After all, faculty members are the primary decision-makers in their courses (Graham and Robison 2007). Institutions intending on adopting and implementing BL should include factors such as policies that addresses faculty promotions, workload adjustments, technical support and intellectual property rights.

The use of technology requires changes in the mindset of faculty. Studies report that there are still many faculty members who have pedagogical difficulties in adapting new instructional delivery method because they value the traditional way of knowledge sharing (Hollis and Madill 2006). Since they are not certain about the value of technology, and their roles and abilities in the process of teaching (Kim and Baylor 2008), they worry that delivering instruction online would decrease the quality of the instruction and students might feel hard to achieve their educational goals. Some faculty members even perceive that online instruction threatens their academic freedom by designating the way of teaching. Faculty see BL as a means of pedagogic flexibility and convenience (Antwi-Boampong 2018).

Also, teacher's personality is a powerful intrinsic motivational factor which influences e-learning technology acceptance. It represents a set of characteristics which make every teacher unique in education process and it is strongly influenced by the surroundings.

The most commonly studied teacher's features are self-efficacy and anxiety, more often approached from the technical aspect. Computer anxiety is closely connected to the teacher's attitude, author suggests the possibility of understanding computer self-efficacy as a construct of perceived ease of use (Timothy 2009). Malik et al. (2010) mention teacher's organizational commitment as an important factor in quality teaching process and Baia (2009) confirmed the influence of commitment to the pedagogical quality on the e-learning technology acceptance. Lack of formal understanding of how to integrate technology in teaching affects faculty ability to adopt BL. Faculty members lack the training to use instructional methods to teach in BL mode to achieve pedagogic goals (Awidi 2008). As Klein et al. (2004) indicated, faculty dissatisfaction with technological tools affects BL adoption. Furthermore, (Ocak 2011) indicates that direction of blended teaching, its adoption and the implementation largely depends on faculty members' adoption of new innovations (Rogers 2003).

Students disposition to adopt BL is affected positively by the student's technology readiness and the ease by which they perceive teaching and learning using BL. In the shared experiences of faculty members, the inclination to teach in BL mode is largely a function of how the predisposition of students are and how receptive they are to the method. Students technology readiness, their

foundational understanding of how to use basic computer tools, and how to use LMS and its functionalities in a collaborative learning environments become a major consideration for faculty as they adopt BL. (Napier et al. [no date](#)) reports that major reason why faculty do not adopt BL is the additional responsibility it comes with as faculty members in addition to teaching become technical experts and have to guide students through solving technical problems relating to learning platforms.

6 Conclusions

For higher education institutions purposed on implementing a successful BL program, the four-key construct in the FBLAM (Antwi-Boampong 2019) become relevant elements if faculty are to adopt, design and execute blended learning solutions. The study suggests that for faculty to adopt blended learning for teaching and learning to be well, four key elements need to be considered:

First, institutions of higher learning must evaluate their institutional readiness relative to policy frameworks, implementation strategies that align with and developed in consultation with faculty as key stakeholders driving the process. Secondly, faculty technology affinity needs to be accessed and where there are shortfalls it is recommended that faculty training programs are instituted to enable them to become fully familiar with the computer programs and technology instructional strategies needed to engage students in collaborative ways that enhances the students learning experiences and ultimately improve learning outcomes. This finds support with Graham's claims (2006) that there is a need to provide professional development for instructors that will be teaching online and face-to-face. Third, institutional support mechanisms that provide technical support to faculty needs to be provided, such as computer components, learning management systems and dedicated centres with instructional technologist who should assist faculty align teaching content to achieve pedagogic fitness where possible. Fourth, lab sessions should be provided for faculty as a means of upgrading their technological readiness to and deliver teaching content targeting students convenience and ease of use with the objective of stimulating positive disposition towards BL.

The outcome of the model finds expression with theories related to motivation and identify similar factors like the motivation hygiene theory (Herzberg et al. 1959). The results show that there are certain units of thought that faculty members consider as predisposing factors leading towards adoption. An analysis against the motivation hygiene theory (Herzberg et al. 1959) revealed that institutional readiness, faculty technology affinity, pedagogy fitness is reflecting in theory and it is consistent with the findings of this study. These factors can be construed as being either motivational (incentives) or Hygienic (disincentives). Similarly, (Oh and Park [no date](#)) showed that the lack of faculty motivation to integrate technology into their courses is the biggest challenge to the implementation of blended teaching. This model is useful and can provide a practical guide to University administrators, policy makers and faculty members intending on implementing and harnessing the utility of technology for the transformation that is desired.

Appendix

Table 3 Selected literature articles used for stage two of work

Articles	Key themes	Findings leading to adoption
(Butler and Sellbom 2002) (Liu no date)	Barriers to technology adoption	Proficiency with using technology, reliability of the technology
(Bolliger and Wasilik 2009)	Factors influencing adoption	student- related, instructor-related, and institution-related factors
(Kasse et al. 2015)	Facilitating Condition for E-learning Adoption	Financial resources <ul style="list-style-type: none"> • Infrastructure • Human resources • Educational content
(Mtebe and Raisamo 2016)	Challenges and Instructors' Intention to Adopt OER	effort expectancy had significant positive effect on instructors' intention to use OER
(Buchanan et al. 2013a, b)	Factors affecting faculty use of learning technologies: implications	high in Internet self-efficacy reported use of more learning technologies than did those lower in Internet self-efficacy
(Previtali and Scarozza 2019) (Humbert 2007) (Findik Coşkunçay and Özkan 2013)	BL adoption by faculty Model for Instructors adoption	Student related issues seem to be the most important factors influencing faculty satisfaction,
(Ngimwa and Wilson 2012)	Empirical investigations into OER adoption	real challenges facing readiness to adopt OER appear to be related to socio-economic, cultural, institutional and national issues.
(Hoffman 2013) (Paridah et al. 2016)	Motivating factors on faculty participation	Extrinsic and intrinsic factors were found to have a positive, statistically significant relationship with faculty member willingness
(Wilson and Morreira 2006; Youn et al. 1999; McLaren and Kenny 2016; Chen et al. 2012; Keller 2008; Gawel 1997; Garrote and Pettersson 2016; Martin 2010; Youn et al. 1999)		
(Bhuasiri et al. 2012) (Altameem 2013)	Critical success factors for e-learning	Findings illustrate the importance of curriculum design for learning performance. Technology awareness, motivation, and changing learners' behaviour are prerequisites for successful e-learning implementations
(Ankit et al. 2015; Shurville and Browne 2007; Porter et al. 2016)		

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