

Requirements for a Blended Learning Framework in Higher Educational Institutions in Uganda

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Abstract

In Uganda, blended learning (BL) has emerged as a popular approach to education, particularly in response to the COVID-19 pandemic, this has forced educational institutions to adopt remote learning models. Complex adaptive and Community of inquiry frameworks have been implemented worldwide to support the adoption of BL. However, the existing blended learning frameworks (BLFs) in Uganda like any other third world country suffer from issues related to policies, training, support and infrastructure. As a solution to the above challenges, a suitable BLF for Higher Educational Institutions of Learning (HEIL) is required. However designing a BLF requires careful consideration of a range of factors to ensure the optimal learning experience for students, thus this study aimed at exploring the requirements for designing a BLF. A cross-sectional survey was conducted in three universities in south western Uganda by the help of a pretested questionnaire which was given to 1495 participants who met the inclusion criteria and consented to participate in the study. Quantitative data was collected and analyzed using IBM SPSS-26. The results revealed that 99% of the respondents strongly agreed that there are no BLFs in their institutions hence need for designing one. However, 7.19% of the respondents were not sure whether they needed a BLF. Furthermore, 94.6% of the respondents strongly agreed that BLF to be designed should align with the objectives of their institutions as one of the requirements to be considered before designing it. Furthermore, 95.9%, 98.8% and 93.8% of the respondents strongly agreed that university policies, training and support for creation of e-content respectively should be highly considered. Therefore, basing on these findings, this research study developed a Requirement Specification Document that can be used as an input for designing a BLF that will enhance the adoption of BL in HEIL in Uganda.

Keywords: Blended Learning, Requirements, High Educational Institutions of Learning, Blended learning Frameworks

Introduction

Traditional face-to-face (F2F), classroom-based teaching and learning has been used for centuries as the ubiquitous delivery method. Distance and distributed teaching and learning opportunities are much newer, particularly in reference to technology-enabled learning. When online education became available, it was used first in distance education, with students studying fully online. Notions of blending classroom-based learning and online or distance education came later (Bigirwa et al., 2000). According to a report by the Babson Survey Group, the number of institutions offering blended learning courses has steadily increased over the past decades (Allen & Seaman, 2017). The report found that 48% of all higher education institutions in the United States offered some form of blended learning, and this trend is mirrored in other parts of the world.

The study by Ssentanda and Ssewanyana (2020) indicate that, the adoption of BL in Ugandan universities has been driven by several factors, including the need to increase access to education, improve the quality of teaching and learning, and reduce costs. The authors note

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that BL has been particularly useful in addressing the challenges of limited resources and infrastructure, which have traditionally hindered the delivery of quality education in Uganda. One of the most common BLFs being implemented in Uganda and other countries is the flipped classroom model. In this model, students are introduced to course content online before coming to class, allowing for more interactive and engaging face-to-face sessions (Mugabi, 2017). Another popular framework is the rotation model, where students rotate between face-to-face and online learning activities (Ssentanda & Ssewanyana, 2020). This approach has been shown to be effective in improving student engagement, as well as providing more flexibility in the learning process.

Furthermore, Complex Adaptive, Community of Inquiry, SAMR and Technology Acceptance Frameworks for blended learning take a comprehensive view of the design and implementation of blended learning (Schaber et al., 2010). They are applicable to blended learning in any segment of education, with appropriate adjustments as necessary based on learners' needs and characteristics, whether you are a teacher or instructor in K–12 schools, colleges and universities, the military, the industrial workplace or the corporate world. Despite the many benefits of blended learning, there are also some challenges that must be addressed. These include the need for adequate training and support for both students and instructors, as well as the need for reliable technology and infrastructure (Mugabi, 2017). In addition, there is a need to ensure that the quality of online content balances with face-to-face content, and that the learning outcomes are equivalent.

Access to Quality education is considered a human right in Uganda according to SDG4 which ensures inclusive and equitable quality education and promotes lifelong learning opportunities for all. This can be achieved through creation of effective learning environment in which blended learning plays a big role (Nakaziba et al., 2019). Due to the increasing demand for higher education against shortages of academic staff and infrastructure, and the growing numbers of institutions of higher learning, some of the Universities that use face to face teaching methods are now turning to blended learning method as a way of delivery services to their students in the campuses to boost the traditional learning methods which do not meet the contemporary needs of our information society any more (Bwire et al., 2020). However, despite the high level of investment in e-learning and blended learning programs, there is a slow adoption of 43% of the users in a given institution for this new pedagogy amongst students and faculty, research shows that 25% of those who do start to use the system opt out later leaving a big gap of low BL adoption (Bigirwa et al., 2020). It is from this background therefore, that this study aimed at establishing the requirements for designing a framework which would ensure the successful implementation of blended learning in Higher Educational Institutions of learning (HEIL) in south western Uganda.

Background

Blended Learning (BL) in its broadest sense can be defined as a mixture of both F2F interaction and computer based instruction delivered via electronic media such as the Internet, intranets, extranets, satellite broadcasts, audio/videotape and interactive Television (Ali et al., 2019). BL is used to facilitate face to face teaching and it refers to teaching and learning that combines both online and F2F teaching and learning. With the increasing demand for higher education against severe shortages of academic staff and infrastructure in the growing numbers of institutions of higher learning, some of the campus-based face to face programs are being delivered through BL approaches as opposed to traditional learning methods. BL is becoming increasingly popular in higher educational institutions in Uganda as a means of improving access to education and enhancing learning outcomes (Tuckwell & du Plessis, 2020). However, the adoption of BL in Uganda faces several challenges, including limited resources and inadequate infrastructure among others (Nakabugo, 2019). This study seeks to investigate the

strengths and weaknesses of blended learning and elicit the requirements for designing a suitable blended learning framework (BLF) to improve the adoption of BL in higher educational institutions of learning (HEIL) in Uganda and provide recommendations for improving its effectiveness. There are several advantages associated with BL such as continuous learning regardless of the geographical location, BL still provides students with time to work with faculty staff, as lecturers are able to connect with them individually through technology this provides a greater level of bonding via collaboration and communication tools that are in built in some of the online tools like the Learning Management System (LMS). Such tools like the discussion boards, files, grade book, electronic mail, announcements, assessments, and multimedia elements would be used for online interaction and finally, BL is important in reducing costs in terms of paper work hence reduction in administrative expenses (Aliweh, 2011; Kabarungi et al., 2016; Beaini & Hasret Balcioğlu, 2017). However there are some weaknesses identified with BL and these could be, high maintenance cost especially the infrastructure, Limited technical skills especially the lectures who lack proper training and wastage of resources due to investing in users who are not yet well trained (Bryan, 2018; Kabarungi et al., 2016; Bigirwa et al., 2000). Poor requirement gathering also lead to misleading of the developers and hence wrong frameworks which contributes a lot towards low blended learning adoption in HEIL in Uganda. It is therefore from this very background that this study was carried out to explore the strength, weakness of BL and elicit the requirements for designing a suitable BLF that will ensure the successful implementation of blended learning.

Methodology

This research was conducted using the open and closed questionnaire as one of the common methods of collecting quantitative data from a large sample of respondents. We identified the variables that were to be measured, and developed questions that were clear, unambiguous, and relevant to our research objectives. The questionnaire was pretested to ensure its validity and reliability. Using the Krejcie and Morgan formula (Krejcie & Morgan, 1970), a random sampling method was also deployed to get 1495 participants (444 Teaching staff and 1051 student) from Mbarara University of Science and Technology (MUST), Bishop Stuart University (BSU) and Kabale University (KAB) which were purposively identified to represent other universities in south western Uganda. These three Universities were selected because they meet the inclusion criteria of being accredited by the National Council for Higher Education (NCHE) and have large numbers of graduate students both government and private sponsored with related courses. The collected data was cleaned by checking errors, coding the responses and analyzed using a statistical package for social scientists (IBM SPSS-26) to establish requirements for designing a BLF. The results are presented in tables, graphs, and charts as indicated below.

Table 1: Selection of the Participants

| Institution Name | Teaching Staff | Students | Total |
|------------------|----------------|----------|-------|
| MUST | 164 | 357 | 1495 |
| BSU | 133 | 353 | |
| KAB | 147 | 341 | |

The first column in Table 1 above represents the institutions where data was collected. MUST stands for Mbarara University, BSU is Bishop Stuart University and KAB stands for Kabale University. The two columns in the center of the table indicate the type of participants and these are the Teaching Staff and the Students respectively from the left-hand side. The last

column on your right hand is the total number of the participants as were selected from the three universities mentioned already.

Results

Demographic Characteristics

Out of 1495 participants from MUST, BSU and KAB, only 1377 respondents returned the filled questionnaires and were actively involved in the study as indicated in Table 2 below.

Table 2: Respondents

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|--------|-----------|---------|---------------|--------------------|
| Valid | Male | 849 | 61.7 | 61.7 | 61.7 |
| | Female | 528 | 38.3 | 38.3 | 100.0 |
| | Total | 1377 | 100.0 | 100.0 | |

Results from Table 2 above indicate that 61.7% of the respondents were male that is both the teaching staff and students whereas 38.3% were female respondents (teaching staff and students) which clarify that this research was gender balanced.

The Current Status of Blended Learning Frameworks (BLFs)

Research carried out by this study show that there are no blended learning frameworks in these universities (MUST, BSU and KAB) as shown in the line graph in Figure 1 below.

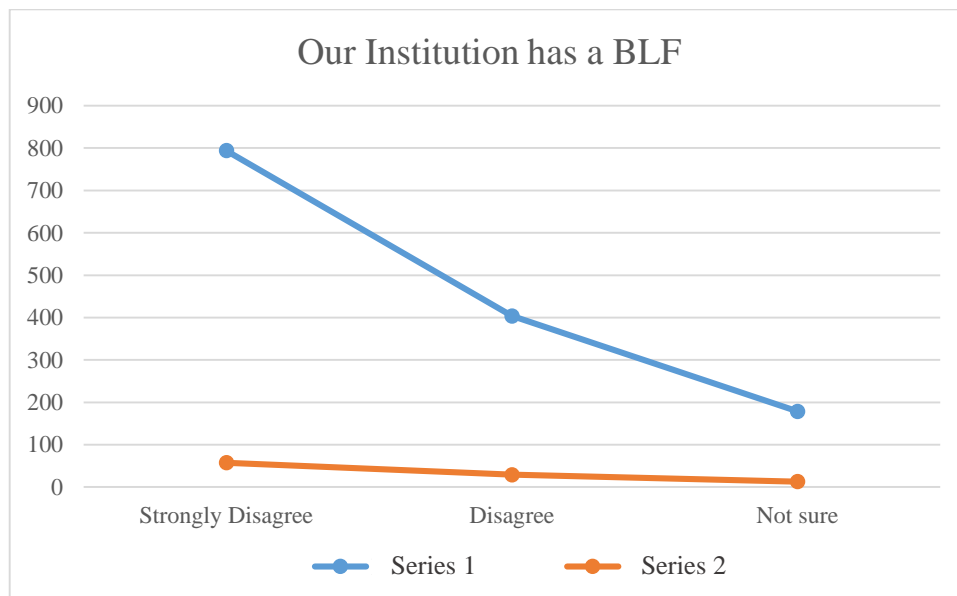


Figure 1: Existence of BLFs in Institutions

Basing on a 5 Likert scale where by 5-Strongly agree, 4 - Agree, 3 – Neutral, 2 – Disagree, 1- Strongly disagree, there was no response reporting from any of the three universities agreeing or strongly agreeing (5-Strongly agree, 4 - Agree) on having blended learning frameworks in their institutions as indicated in Figure 1 above. Majority of the respondents strongly disagreed others were not sure of the existence of blended learning frameworks in their institutions.

Need for Designing a BLF

It was found out that there is need to design blended learning frameworks which supports the adoption of blended learning in higher educational institutions as shown by the results gathered from MUST, BSU and KAB as illustrated in Figure 2 below.

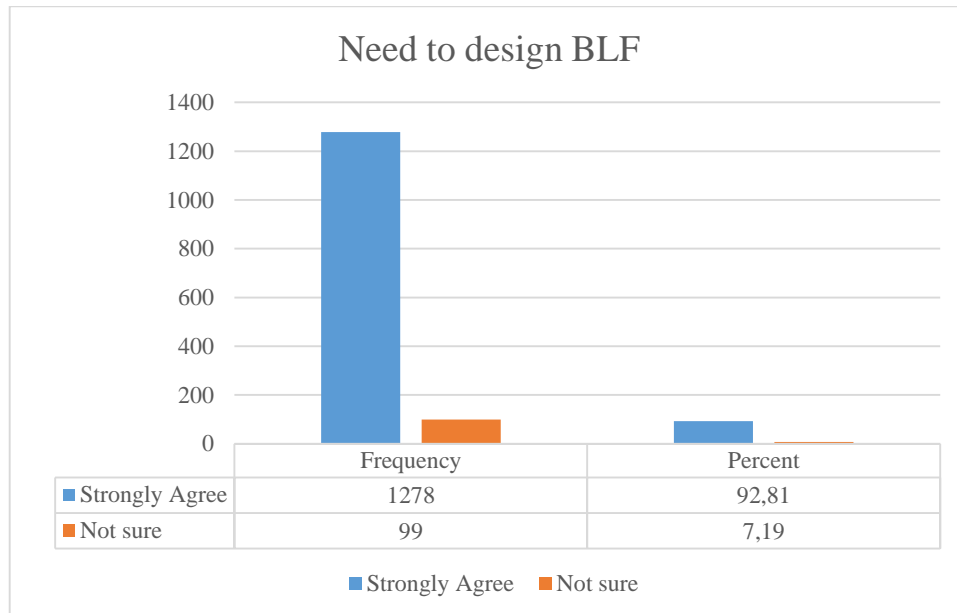


Figure 2: Need to design BLF

Results from Figure 2 above, show that 99% of the respondents strongly agreed that there is need to design blended learning framework whereas 7.19% of the respondents were not sure whether their institutions need BLFs or not.

Requirements for Designing BLF

Figure 3 below indicates the requirements that were elicited by the respondents from the study.

Results in Figure 3 above show that; 97.6% of the respondents strongly agreed that there is need for a well-established infrastructure ranging from the internet, well equipped laboratories and electricity for BL to be adopted via a given BLF. 95.9% of the respondents strongly agreed that BLF should be considered as a policy with in their institutions if it need to be followed. More so, to design a BLF one must put into consideration the communication strategies because communication is very important for both the students and the lecturers. 93.8% of the respondents went ahead to agree that any BLF to be designed must support the developing of e-learning content. Furthermore, 98.8% of the respondents stressed that a BLF should enable the lecturers and students to be trained and gain enough skills required to adopt BL. Finally, 89.8% and 94.6% of the respondents clearly agreed that a BLF should fit within the budget of the institution and it should match with the objectives of the given institution respectively.

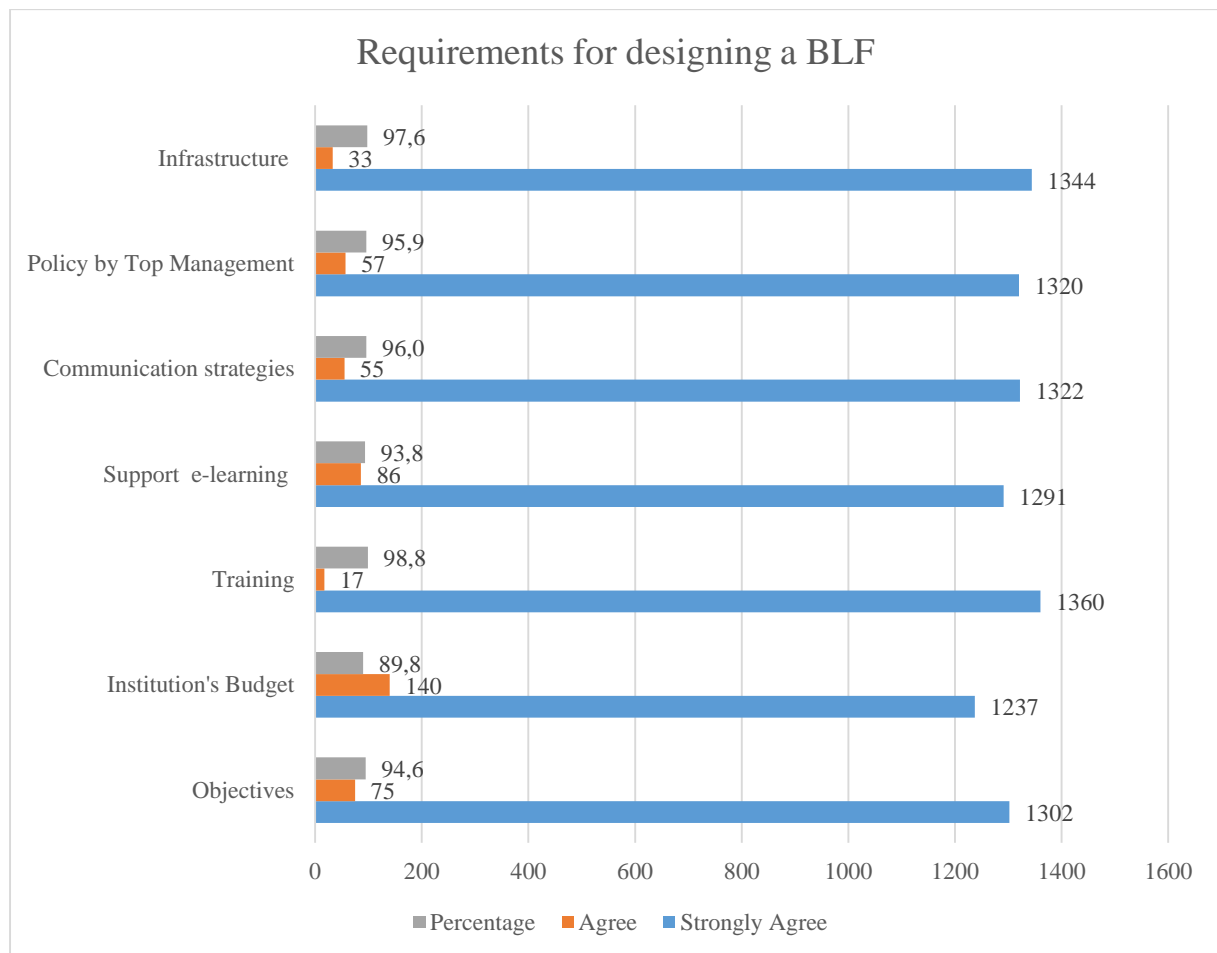


Figure 3: Requirements for BLF

Discussion

Table 2 shows that this research considered both male and female participants which is highly supported by other researchers like it has been emphasized in the American Psychological Association (2017) that researchers should strive to ensure that their research is inclusive and respectful of diverse populations, including gender identity and expression. This study went ahead to establish the need for designing BLFs for Educational Institutions as indicated in Figure 2 by a high response of the participants (99%) who strongly agreed that there is no BL frameworks in their institutions hence the need to one. Literature revealed that, the study carried out by Hodges et al. (2020) emphasized the need for designing blended learning frameworks that are context-specific and take into account the unique challenges faced by developing countries.

The results of this study conquer with the findings by Bigirwa et al. (2000) which emphasized that the effective infrastructure is necessary to support blended learning programs, this includes access to reliable and high-speed internet, appropriate hardware and software, and a learning management system. More still, according to the Edu cause Learning Initiative (2012), "adequate infrastructure is essential for blended learning programs to function effectively and ensure that all students have access to the tools and resources they need." It has been noted that Effective training and support are essential for teachers to successfully design, implement, and manage blended learning programs.

Teachers need to be trained on how to use technology tools, integrate them with traditional teaching methods, and design effective assessments. According to the U.S. Department of Education (2010), "teacher training and support are critical to the success of

blended learning, and should be ongoing to ensure that teachers are equipped with the skills they need to provide quality instruction." Figure 3 of this study clearly portrays that training is one of the crucial requirements to be considered before, while and after designing the BL framework. Looking at aligning BL framework with the institutional objectives as one of the requirements to design BLF gives us the clear picture of what the developer should come up with.

Research indicates that, clearly defined learning objectives are crucial for the success of blended learning programs. These objectives should be aligned with the overall goals of the institution and guide the selection of appropriate technology tools, teaching methods, and assessments. According to the Online Learning Consortium (2019), "clearly defined learning objectives enable instructors to design effective blended learning frameworks that enhance student learning and engagement."

Clear policies and guidelines are essential for the effective implementation of blended learning. These policies should cover issues such as access to technology, data privacy, intellectual property, and student expectations. According to the National Education Policy Center (2015), "policies and guidelines should be in place to ensure that the implementation of blended learning is consistent and equitable for all students." It has been stressed in this research check Figure 3 that one of the requirements to consider while designing BL framework is "policies". These could be Institutional policies that must be followed by all the workers and especially when it comes to BL then certain benefits and promotions could be attached for the best e-content developers and users with in the given platforms like LMS or Moodle. In relation to this, budgeting is very important while running any institution. Therefore, BLF developers should make sure that BL framework to be designed fit in the institution's budget to ensure the successful implementation of blended learning and avoid unnecessary expenditures beyond its budget.

Furthermore, BL frameworks should not only target higher educational institutions but even lower levels right away from primary schools because according to SDG4 section 4.1 emphasis is that by 2030, they must ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and Goal-4 effective learning outcomes.

However, to promote equal education and through BL adoption requires a well-designed BL framework with good steps and procedures which enable the intended users to apprehend and get the desired output. It is from this background therefore, that the researcher focused on establishing the requirements for designing a BL framework to ensure the successful implementation of blended learning in HEIL. The output of the requirements of BL framework is the Requirements Specification Document that leads to the designing and developing of a Blended Learning Framework.

Requirement Specifications for Blended Learning Framework

Blended learning is an approach that combines online learning with face-to-face instruction to create a more flexible and personalized learning experience (Nakabugo, 2019). A blended learning framework is a set of guidelines and requirements that ensure the successful implementation/adoption of blended learning. Here are some of the key requirement specifications for a blended learning framework obtained from the survey that was carried out as indicated in Table 3 below.

Table 3: Requirement Specifications for BLF

| Requirement Specification Document for designing a Blended Learning Framework for Higher Educational Institutions Case of South Western Uganda. | | | | | | | | | | | | | | | |
|--|--|------------------|------------------|------------|---------------------|----------------------|------------|------------|----------------------|----------------------------|---------------|-----------|------------------|----------|--|
| 1 | Purpose | | | | | | | | | | | | | | |
| | The purpose is to design a BLF to ensure the successful implementation/adoption of blended learning in HEIL. | | | | | | | | | | | | | | |
| 2 | Scope | | | | | | | | | | | | | | |
| | BLF will focus on both Asynchronous and Synchronous approaches in teaching and learning environment. | | | | | | | | | | | | | | |
| 3 | Implementation Language | | | | | | | | | | | | | | |
| | A Unified Modelling Language will be used to design a BLF | | | | | | | | | | | | | | |
| 4 | Intended End Users | | | | | | | | | | | | | | |
| | User 1: Teaching Staff in Universities | | | | | | | | | | | | | | |
| | User 2: University Students | | | | | | | | | | | | | | |
| | User 3: Administrative Staff in Universities | | | | | | | | | | | | | | |
| | User 4: Ministry of Education and Sports | | | | | | | | | | | | | | |
| 5 | Intended Uses | | | | | | | | | | | | | | |
| | Student Centered learning | | | | | | | | | | | | | | |
| 6 | Blended Learning Framework Requirements | | | | | | | | | | | | | | |
| | a) Nonfunctional Requirements (NFR) | | | | | | | | | | | | | | |
| | NFR 1: Usability (Asynchronous and Synchronous teaching and learning styles) NFR 2: Availability (Internet) NFR 3: Environment (Education) | | | | | | | | | | | | | | |
| | b) Functional Requirements (Competency Questions) | | | | | | | | | | | | | | |
| | CQ 1. What is Blended Learning (BL)? CQ 2. What is Blended Learning Framework (BLF)? CQ 3. What are the benefits of a BLF? CQ 4. How much computer skills do you have to participate in BL? CQ 5. What has been your biggest challenge in adopting BL? CQ 6. How did you maintain the good number of graduates during COVID 19 pandemic? CQ 7. Describe a situation in which BL can be more of help during teaching and learning? CQ 8. Tell me about the areas to improve and enable a successful implementation of BL? CQ 9. How best are you in creating online content? CQ 10. How is budgeting important in designing a BLF? CQ 11. Describe a situation how University policies have played a big role in promoting BL? CQ 12. What other requirements would you like to be considered while designing a BL | | | | | | | | | | | | | | |
| 7 | Pre-Glossary of Terms | | | | | | | | | | | | | | |
| | <table border="0"> <tr> <td>Blended Learning</td> <td>Computing Skills</td> </tr> <tr> <td>University</td> <td>E-Learning Platform</td> </tr> <tr> <td>Traditional Learning</td> <td>Assessment</td> </tr> <tr> <td>E-Learning</td> <td>Support and Training</td> </tr> <tr> <td>Blended Learning Framework</td> <td>Communication</td> </tr> <tr> <td>Budgeting</td> <td>Support strategy</td> </tr> <tr> <td>Training</td> <td></td> </tr> </table> | Blended Learning | Computing Skills | University | E-Learning Platform | Traditional Learning | Assessment | E-Learning | Support and Training | Blended Learning Framework | Communication | Budgeting | Support strategy | Training | |
| Blended Learning | Computing Skills | | | | | | | | | | | | | | |
| University | E-Learning Platform | | | | | | | | | | | | | | |
| Traditional Learning | Assessment | | | | | | | | | | | | | | |
| E-Learning | Support and Training | | | | | | | | | | | | | | |
| Blended Learning Framework | Communication | | | | | | | | | | | | | | |
| Budgeting | Support strategy | | | | | | | | | | | | | | |
| Training | | | | | | | | | | | | | | | |

The requirements were gathered from literature and the survey that was carried out from MUST, BSU and KAB University as indicated in Table 3 above. This summary of the requirements will be used to design and develop a Blended Learning Framework that will enhance the successful implementation/ adoption of Blended Learning in Higher Educational Institutions in Uganda.

Conclusion and Future Work

This study established the requirements for designing BL framework for some Universities in south western Uganda. The findings of this study can be considered by institutional managers as they embark on BL transitions. This study contributes to the understanding of what BL frame work designers should consider while designing BLFs for their institutions. Giving the challenges of infrastructure, policy, training and support from top management, this study has found that these challenges need to be addressed for one fully implement and adopt BL. Thus, ministry of education, University Officers and managers should address the infrastructural bottlenecks that work against BL adoption. However, this study has been limited with a small sample of participants who were from only the three universities from south western Uganda that represented the entire country. We therefore, encourage a bigger population size for the future study of the same kind.

Recommendations

This study recommend that BL frameworks should be embraced by all higher educational institutions because they help on improving blended learning adoption. All institutions should acquire ICT skills as one of the requirements that both lecturers and students need before starting to use BL. Blended learning Framework should be included among the institution's policies as one of the requirements needed before designing a BLF. The researchers do recommend a broader study to be carried out in future that encompasses each and every body in several Universities.

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