International Journal of Computer Applications Technology and Research
Volume 11–Issue 04, 103-117, 2022, ISSN:-2319–8656
DOI:10.7753/IJCATR1104.1001

Affordances of Successful Blended Learning Implementation in Higher Education: A Case Based Study

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Abstract: Over the last couple of decades, online learning has been growing in line with growing computer-based technology to the now almost fully fledged e-learning supported by artificial intelligence. Early predictions foresaw a case whereby the teacher would be fully supported or even replaced by technology in the delivery of content and assessment of learning. This is an area that has remained the subject of inquiry and technology around the concept is still evolving. The onset of COVID -19 pandemic in 2020 saw many universities having to turn to online learning to complete their courses. The emergency movement to remote teaching caught many universities unaware, but several lessons were also learned. With time, humanity is coming to appreciate that COVID19 is endemic. We have thus experienced a resumption of classes. With social distancing still being a requirement, most universities are now turning to blended learning in order to benefit from the affordances of face to face teaching and also leverage on existing technology, it is imperative to review the critical success factors that come into play for successful implementation of blended learning. This case study looks at one of the first private universities to resume studies in a blended mode during the pandemic in Kenya. It evaluates the key areas that have to be attended to for a successful transition to blended learning. The study identifies Organizational affordances, Academic affordances (Programs, assessments and examinations), Technological Affordances, Digital Resources affordances and Pedagogical affordances as crucial for successful implementation of blended learning.

Keywords: blended learning; successful implementation; higher education; affordances; technology.

1. INTRODUCTION

The contribution of Information Communications Technology in the teaching and learning process can not be underestimated as approaches allow learning to take place both inside the campus. Distance education has existed over several decades, especially with the development of the mailing system that allowed correspondence learning. The rapid spread of the Internet has facilitated learning in multiple and diverse formats, especially enhancing learning from remote locations and also blending several delivery approaches. Distance learning has long supported the spread of higher education by enabling allowing anyone willing to learn to gain access to do so (Elleithy &Sobh, 2015; Holt, Segrave & Cybulski, 2012). In addition, mixed forms of face-to-face learning and online learning provides a

blended learning environment where students obtain knowledge through the combination of traditional and online learning (Siemens, Gašević, & Dawson, 2015). For effective blended learning to take place, technological, pedagogical people and organizational issues should be put in place.

Torrisi-Steele (2011) defines blended learning as "enriched, student-centered learning experiences made possible by the harmonious integration of various strategies, achieved by combining f2f interaction with ICT.' (p.366). It comprises of several innovative concepts that are derived from the intersection of the traditional classroom and learning that is supported by ICT for offline and online teaching and learning. Some of the key supporting concepts include computer-aided learning, constructive and collaborative learning. To achieve the desired scope of blending, the concerned parties should demonstrate the right attitude, rigor, and high motivation for both teachers and students, and the administrators should be prepared to spend a substantive budget on the same (Dangwal, 2017; Apandi &Raman, 2020). The incorporation of diverse modes makes blended learning a complex concept that should be carefully planned and organized in order to succeed. If well organized, blended learning can bring together an interactive learning environment that combines online and classroom learning activities that can lead to optimal use of resources in order to improve learning outcomes and also address important institutional concerns (Kaur, 2013; Garrison, Anderson & Archer, 2000)

In the beginning of 2000, Blended learning emerged as one of the most popular pedagogical concepts. Many institutions have adopted this mode, although technological affordances have prevented it from flourishing. However, in the recent last, and with the onset of Web 2,0 and web 3.0, traditional learning has been blended with distributed learning environments (Guzer & Caner, 2014). The onset of COVID-19 pandemic made it almost mandatory for institutions of higher learning to take up blended learning. Blended learning is credited for being easily adaptable to learners needs, since online resources can be used in many ways to bring in the much desired flexibility. The learner and the faculty can change the learning materials and activities to suit the specific learning conditions. Blended learning is also known to involve the learner in planning process, resulting in creativity and critical thinking. In addition, it can help create independent learners and reduce the instructors' workload in the process. The time saved can be used in creating more strategic resources and materials. No wonder this was one of the fall back approaches used by many institutions during and post COVID-19 education.

Currently successful blended learning is created using tablets, smart phones and touch screen technologies and modern communication aps such as Facebook, Twitter, WhatsApp, YouTube and videoconferencing software. As these technological applications spread, it is important to study how to blend the various concepts in order to improve the learning outcomes and also benefit the institutions. Of great interest now is how to identify and use digital tools and platforms with advanced human-computer interactions and automation capabilities of these tools to create intelligent tutoring systems that improve learning and also facilitate self-paced learning and improve collaborative

learning, assessment and feedback (Castro, 2019).

The main players in the successful implantation are the faculty who need to know how to use the technology effectively, the learners who must not only know how to use the technology but must be aware of how to self-regulate, as well as the institutions who must provide suitable instructional technology and support but also train both faculty and students (Rashhed, Kamsin& Abdullah, 2020; Singh, 2021). Moreover, there is still need to investigate how modern Universities have positioned online learning with respect to on-campus and off campus learning as learning current research shows that higher education largely focused on curriculum development and content design (Gros & Garcia-Penalvo, 2016), which might have left out other crucial factors for effective blending focused on content design and curriculum development. However, in order to develop personalization, adaptive learning is crucial.

The main purpose of this study is to document, review, and analyses how one University successfully migrated to blended learning and to document the affordances that are to be considered for successful blended learning implementation.

2. LITERATURE REVIEW

2.1 Blended Learning

Many authors have given varying definitions of blended learning. It is important to articulate the form that one is dealing with in order to successfully identify the critical success factors that would lead to its successful implementation. Some authors have described it a combination of traditional face to face teaching and online teaching, usually using learning technologies in a virtual learning environment using Learning Management Systems (LMS) such as Moodle, Canvas or blackboard. Such a description categorizes learning as both synchronous and asynchronous with live chats and bulletin boards used for collaborative purposes. (Sharma, 2010; Gearhart 2010)

Another definition of blended learning is a combination of technologies, media and tools in a purely distance learning course taken over the internet (Hamalainen & Hakkinen, 2010; Anthony et al, 2020), without much concern and organizational factors. The technology to use is largely pushed to the learner with the University only providing the content (Maeroff, 2003; Hadjar &Gross, 2016). Others define it as a combination of a combination of methodologies and pedagogical approaches without much consideration of the learning technologies in use, and consider constructivist, collaborative or transmission approaches only (Miller, 2014). Many other terms such as the flipped classroom fit into this category (Gearhart, 2010) as practitioners try to improve the learning outcomes.

For purposes of this study, we define blended learning on the basis of a combination of face to face learning and the use of ICT and online technologies to complement and supplement the teaching and learning and improve the learning outcomes.

2.1 Blended Learning Affordances

According to Gibson (1977), an affordance is a pre-condition for an activity, and it

describes action possibilities available in the environment for an actor. An affordance arises from the user-artifact relationship, and affects how the actor will use the artifact to arrive at a certain goal. Although the theory of affordances has been used in many Information System Research projects, and mainly refereeing to technology, other non-technology artifacts have been included in such studies.

Blended learning borrows heavily from both online and face to face learning, with technology being the mediating factor. In all teaching and learning situations, the focus should be the learner and the Learning Outcomes. A successful blended learning environment should therefore ensure that the learner has the option of ether modes. This allows a personal interaction with the instructor and the classmates and also the option of ICT supported learning, depending on the nature of the content and the objectives to be achieved. Instructional designers and the instructors can also help (Manhas, 2012; Iskander, 2008). Another important feature of the blended learning is that the instructors need to be very dynamic, techno savvy and fully trained to effectively teach in both face to face and online modes (Ololube, 2014), and both classrooms should be well equipped with the requisite technologies efficiently in both the formats-traditional classroom format and ICT supported format. In the blended mode, the students get sufficient time to interact with other students pursuing the same course (Henri& Pudelko, 2003) and they get to interact with them inside on campus and also off campus (Gorjanc, Egorova & Zitec, 2016). This enlarges the circle and therefore the diversity of the student's knowledge (Mukama, 2010), creating a learning community across courses, cultures and countries.

We are living in the age of technology, and blended learning helps to augment the learner's ICT literacy (Palloff & Prat, 2009, especially where innovative technologies such as virtual labs, simulations and artificial intelligence are blended in with face to face learning. When these learners meet the same technology in their final workplace, the benefits can be amazing. Blended learning allows students to get skills in multiple areas of life and work, and also to practice these skills as they move from one mode to another. Having to switch from an online platform to a face to face class allows empathy, decision making capability, critical thinking, patience, self-management and communication (Parsons, 2016; Raiker 2009), allowing the learner to consume and also construct knowledge. It also helps to build an all-round personality (Wankel & Blessinger, 2013). The Tradition classroom setup is helpful in the cognitive domain development while the behavior, lab experience and social group with classmates develop affective and physical domain (Stahl, 2010) while online experiences build a reflective level of learning. If used correctly, so develop higher faculties social networking sites and other social interactions through the internet develop the right values (Vickers, Field & Melakoski, 2015).

Unlike pure online learning, blended learning allows for sports and other exercises that are good for the body (So & Bonk, 2010) as well as get a wide exposure to new perspectives of the course content (Salmon, 2004) and gives learning a human touch (Visser, 2012). Furthermore, it provides a multidimensional approach to the teaching and learning process (Simonson,

2014) and allows the instructor to play diverse roles (Romero& Lambropoulos, 2011: Pandey 2017). If well implemented, blended learning can exploit the benefits of flexibility of time, place and other constraints and also create worthwhile collaborations and interactions between the faculty and the learners. It can also enable the learner-centered approach to be established more effectively (Dewi, Ciptayani, & Surjono,2018). However, the same drawbacks of face to face learning may exist, since most online courses are designed in a similar manner as the face to face ones, and taught by the same instructors and in a similar approach (Buran& Evseeva, 2015), perhaps due to lack of resources or due to lack of professional development of the instructors.

According to Dewi, Ciptayani& Surjono (2018), the critical success factors for blended learning include (a) infrastructure, (b) integration (IT, content, and learning process), (c) professional development (teacher, student, and information system management), (d) Support (policy and financial), (e) culture (attitude). Proponents of blended learning request that Universities provide extra computing resources such as servers, bandwidth and storage capacity (Soomro et al; 2018), but also develop comprehensive institutional and organizational environments to promote the establishment of blended learning. .Khans Octagonal Framework (Khan, 2005) Identified eight dimensions for meaningful E-learning: Institutional, technological, interface design, evaluation, management, resource support, pedagogical and ethical issues.

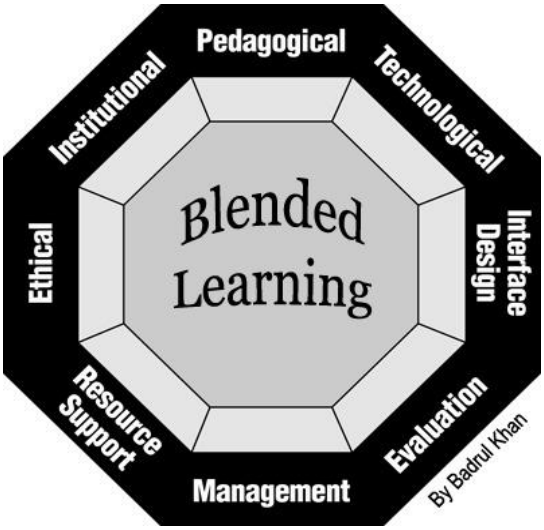

Fig 1. Khan's Octagonal Framework (Khan, 2005)

The institutional dimension reviews organizational and administrative issues that address the level of preparedness of the institutional to offer blended learning, and can easily be picked from needs assessment. Pedagogical issues have to do with instructional design such as analysis of the content, the learner needs, the objectives and the desired learning outcomes as well as the design and strategy of the blended mode. The technological dimension aspires to create a learning environment that has the requisite technology such as the Learning Management Systems and other technical requirements such as servers, bandwidth and related infrastructure. The Interface design issues relate to how the different elements relate with each other, the navigability and content structure and help of all the related elements. The evaluation dimension is concerned with the program is able to evaluate the performance of each learner and

the evaluation method to be used for each delivery type (Khan, 2005).

The management dimension is concerned with the logistics of managing both the face to face and technology aspect of the mode in order to integrate them seamlessly, and how issue such as registration and scheduling and handled. Resource support ensures that the different types of resources are well organized and available for the learners. This dimension could be managed by personnel or could even be automated. The ethical dimension addresses issues such as equal opportunities, cultural and national diversity since blended learning reaches out to learners from diverse backgrounds sometimes on a global scale. (Singh, 2021). Given all these factors, it is important to establish how unique institutions have handled the implementation of blended learning and the unique experiences they have gone through.

Based on the work of Khan (2005) on the critical success factors for blended learning, and the work of Gibson (1977) on the affordances theory, it is critical to evaluate how these two great works came to play in institutions of higher learning during the COVID-19 pandemic. study sets out to address this knowledge gap.

3. METHODOLOGY

The case study methodology was used in this study. The data collected for use in this study was collected from one private University in Kenya. The design of the study utilized qualitative and quantitative approaches to collect the data. Semi-structure interviews were used to extract data, and questionnaire was designed for the same purpose. To ensure complete coverage of the target teams, the Director in charge of online learning, the Heads of respective teaching departments, the IT team, teaching staff, faculty administrators, the head of the library, the registrar were interviewed. The survey was administered online using Google Forms and focused on the implementers of the blended learning. The main focus was on what the users perceived to be critical in the successful implementation of blended learning. Users were allowed to respond to areas where they felt involved, such as in planning, designing equipping, training, teaching and assessment of the learners. The questionnaire was 3 pages long and comprised of 28 questions with a mix of open ended and multiple response questions, with some asking for further explanations to allow drilling down. The original tool was piloted with 2 heads of departments and 2 teaching staff and then fine-tuned to remove ambiguity, then finalized for distribution. Participants were given 3 days to complete and return the survey. Out of the 142 participants approached via email, 92 responded, amounting to 64% response rate. The data was then cleaned and analyzed.

3.1. The Case Study Institution

The case study institution was a private university in Kenya located in in Kiambu County which had started implementing blended learning in January 2020 just before COVID struck, and had to accelerate the adoption in March 2020 to deal with the emergency closure of the Universities occasioned by the Pandemic. The University is now using blended learning and has just recently gotten all its programmes accredited by the local regulator, the Commission for University Education (CUE) to offer Odell and blended

courses. The university has a fully-fledged digital school and offers 12 undergraduate degree programmes, one Masters programme and a number of diploma and certificate programmes. There is a main campus and 2 learning centers. With a student population of over 6000 and a staff complement of 230 administrative and teaching staff, the main programmes include ICT, business, media studies, education, hospitality and international relations. Before the implementation of the Blended learning, the university was using technology to teach but at a much lower scale, focusing on common courses only.

3.2 Blended Learning at the Case Study Institution

Blended learning implementation began with needs analysis after many queries from learners on the possibility of them studying from home. A founder department was set up with skeleton staff who formed a committee with membership drawn from ICT, teaching departments and the finance and planning units. They embarked on benchmarking with global and local institutions and reference to the local ODEL standard to set up the requisite policies, the management structure, identifying suitable courses for blending, suitable Learning management system and other supporting tools, digital resources for the library, training faculty and students and developing modules as well as digitalizing content. They also had to evaluate the best easement and methods for the learners, and how to monitor teaching and learning for effectiveness.

The first step was to develop policies and procedures on blended learning. This involved looking at the curriculum, deciding which courses can be face to face, online or blended, and the best approach for each content. The requisite library resources and the ICT for mode and content was identified. They then trained faculty on how to teach and examine on blended mode. The institution settled on Moodle as the main Learning management system, largely due to its open source nature which made it easier to access and to customize. The LMS was hosted by an offshore company but later moved to the local NREN. To ensure that only accredited curriculum was used, the faculty developed modules that could be used in both face to face modes and online teaching. They are currently in the process of digitizing the same.

The online material was then loaded into the LMS and the test phase began. The piloting was done using 2 common university courses, Communication skills and Health and wellness, before the same being escalated to other University courses. The University has been reviewing its offering on regular basis, with most of the focus being on upgrading the LMS and the resources such as the bandwidth, the devices in use and the digital resources, the policies in place and training both staff and students. It is now generally accepted that the programmes run on a blended mode, and the timetable has been adjusted to reflect the same. The concept of blended learning is now fully entrenched in the University's 2022-2031 Strategic Plan.

4. FINDINGS AND DISCUSSIONS

Of the 142 participants approached, a total of 92 responses were received as follows: 2 from the library, 12 from the digital school, 3 from the ICT department, 6 from faculty

management, 58 teaching staff and 11 finance and administration officers. Since most of the questions were open ended, the responses were analyzed and any concern that was raised by at least two respondents was considered relevant. The questions were grouped according to a). Curriculum, faculty and student's issues b). ICT Infrastructure c). Library and Digital Resources and d). Organizational affordances. The respondents were expected to highlight the major issues that hindered or led to successful implementation of blended learning, and what areas of improvement they would want to see in the process.

4.1 Curriculum, Faculty and Student Affordances

On the curriculum, faculty and student issues, Table 1 below outlines the major concerns to be addressed for successful Blended learning to occur. This section was important since for teaching to take place, you need the learners, a basic curriculum or course of study and the faculty to provide the teaching and ensure that the learning outcomes are met. Questions lingered on what was the most important aspect for the Learning Outcomes to be achieved.

Table 1: Curriculum/ faculty and students' issues

Common Areas	Frequency
Existence of approved blended curriculum	55
Availability of current and relevant content	3
Ease of teaching practical subjects	5
Currency, relevance and frequency of faculty training	53
Availability of instructional designers	25
Specific guidelines for Blended delivery	19
Quality and security of exams	75
Mechanisms for monitoring teaching and learning	18
Provision for giving feedback to students	52
Lecturer evaluation mechanisms	34
Diversity of examination modes and assessments	39
Authentication of learners in blended mode	73
Orientation and training of students	65
Integrity of examinations in blended mode	83

The issues of the curriculum, the authentication of learners, training and orientation of both faculty and students and feedback seemed to be of high concerns amongst the respondents

4.2. ICT Infrastructure

Blended learning requires a mix of face to face and technological infrastructure, with the ICT being the main differentiating factor. Questions lingered on what the users thought was critical for them to deliver the online aspect of the blended mode.

Table 2 below outlines the major issues that the users raised as necessities related to ICT infrastructure.

Table 2: ICT infrastructure Affordances

Common Areas	Frequency
Existence of Core ICT Infrastructure such as servers and PCs	18
Access to a suitable Learning Management System	54
Usability and interoperability of the LMS	5
LMS support for research and project supervision	53
Ability to export and share data in different formats	25
Ability to download content and read and print offline	19
Availability of Antiplagiarism software for online assignments	75
Ability to track students in the online mode	18
Linkage of the LMS, the ERP and the website	52
Students registration and attendance tracking for the online mode	34
Reliable and affordable internet access	39
Ease of changeover between face to face and online modes	73
Security of data and records stored in both physical and online modes	65
Clarity of the interface between face to face and online modes	83

Amongst the biggest concerns was the LMS, the interface, ease of changeover and the security of the system as well as the overall integrity of the process as indicated by the concerns on availability of a suitable anti-plagiarism software.

4.3. Library and Digital Resources

In a face to face establishment, the library is easily accessible physically and users can borrow both physical and digital resources. The questions in this section lingered on what and how users access additional and supplementary resources remotely. The issues of library and digital resources for remote access are highlighted in table 3 below.

Table 3: Library and digital resources affordances

Common Areas	Frequency
Availability of E-books and respective physical books	92
Ease of access and reliability of remote library access	3
Trained library staff to support faculty and students for online access	90
Training services for staff and students	53
Active links to online courses	25
Access to other libraries and data bases	19

The respondents were largely concerned about training of both library staff and the users as well as availability of the resources remotely and physically.

4.4 Organizational Issues

The management is expected to provide organizational support and all other resources to support the faculty and the students. The questions asked here were concerned with the kind of support that users expected from the University to offer blended learning. The critical issues are identified in table 4 below.

Table 4: Institutional support and management issues

Common Areas	Frequency
Existence of a functional unit to manage blended teaching	18
Availability of policies on pedagogy, privacy, research and training	67
Policies on intellectual property and copyrights	16
Mechanism for vetting modules for online mode	53
Clear guidelines on recruitment and training of blended faculty	54
Specific guidelines and procedures for blended teaching and exams	88
Staff and students handbook on blended teaching	75
Mechanisms for monitoring teaching and learning	56
Marketing plans for blended teaching	52
Needs assessments and catering for special needs learners	34
Financial feasibility and viability	54
Acquisition of devices for staff and students	73
Budgetary allocation for blended learning	
Integrity of examinations in	

blended mode	88
	83

This section received the highest frequencies across the questions, indicating that users expected the management to play a critical role in the success of blended learning, with support expected in diverse areas ranging from the budget to recruitment to resources and security.

5. CONCLUSIONS AND RECOMMENDATIONS

The respondents identified several factors that are critical for successful blended learning implementation. If an institution can afford to address these issues, then the whole process will be beneficial to all the stake holders from students to faculty to management to the stakeholders. Careful analysis of the findings yields five affordances:

The institutional and organizational affordances address the planning for blended learning, the financial viability, human resource availability. the feasibility studies, benchmarking and availability of resources such as studios to support both modes, the budgetary allocation and the collaborations and partnerships since one organization is not able to supply all these together. A supportive environment with clear policies and guidelines is identified as key element of this organizational affordance. This supports Rasheed, Kamsin & Abdullah (2020) who pick out challenges of the online component of blended learning.

Academic affordances have to do with the content/curriculum, the students and the faculty. This requires that there is a well-developed curriculum that can be offered in both online and face to face modes. The institution has to select the mode of delivery for each type of content and decide on the percentage of blending. This requires the course design to be well articulated and quality assurance mechanisms to be put in place. This is concurrence with Jean-Francois (2013) and also Iskander (2008) who alluded to that fact that the design of the curriculum should be flexible enough to allow various modes.

Pedagogical affordances refer to the actual mode of delivery and how to get feedback from students, how to evaluate the course and ensure the achievement of learning outcomes on the blended mode. For example, if a course has both face to face and online elements, there should be clear guidelines on the type of examination that will be offered for which instance. This affordance demands a lot of training for both staff and students as well as the support teams, and also includes elements of academic advising. This agrees with Khan (2005) and the issues highlighted in his Octagon.

Technological affordances refer to the availability of the requisite technology including the servers, the hosting, the LMS and other tools for teaching and simulation, including videoconferencing and virtual labs where needed. Some of the technology is not used for online teaching but the face to face classes; projectors and presentation software fall in this category. Monitoring of teaching and reliable internet connectivity are some other technological requirements, as well as ways of checking for plagiarism and enrolling students for the online mode, in

agreement with Previtali & Scarozza (2019) and Park & Shea (2020).

Digital resource affordances refer to the library to supplement the physical books for the online mode. Remote access software and links to relevant databases, plus the training on how to use these are also elements that will make blended learning to be a success.

The five affordances grouped as organizational, academic, pedagogical, technological and digital resources are crucial for any institution to succeed in blended learning implementation. It is good to note that all these affordances are interrelated, and training and ICT cut across them. It would be futile to develop a good curriculum and buy the requisite technology without training both students and staff, or have a good curriculum and trained faculty without the requisite technological resources.

This study did not talk to the main recipients of the teaching, that is, the students, and perhaps future case studies can incorporate the learners for a deeper perspective on the affordances. Policy makers can refer to this case study when rolling out or reviewing a blended approach.

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