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**Abstract**

Over the last decades, our classrooms have been enshrined with the use of chalk and talk teaching. Contrary to the century we are in. Hence, an alternative to traditional teaching and learning is now sought after among stakeholders in education especially, experts in educational technology. Consequently, traditional teaching approach is fading away in the pace of time, possible developments in e-technologies have emerged as a new landscape in educational delivery system where physical and virtual environments are blended to support or supplement learning, increase access and convenience and achieve greater cost effectiveness. Owing to the newness of the blended learning concept in Nigerian education system, little is known about what makes a successful blended learning experience. This paper provided an overview of the concept, models and the position of higher education in Nigeria and the rationale for blended learning. Furthermore, the paper highlighted the challenges of blended learning in Nigeria such as instructional design frameworks and bandwidth access and recommends that academic institutions provide facilities such as student computer laboratories and internet connectivity that can support blended learning environment for both instructors and students.

**Keywords:** Blended learning, innovative pedagogy, e-technologies, education.

**Introduction**

It has been observed with dismay that, traditional physical classrooms have been the dominant form of knowledge transfer for at least, 3,000 years, and the last universal technology in learning, "the printed book", is over 500 years old (Rooney, 2003). Even today, nearly 80% of teaching learning process is conducted in the classroom. In Nigeria the situation is not different, teaching and learning is entirely classroom based with little or no use of audio-visual materials such as videos, experiments, slides, maps, charts, graphs and many other instructional materials that can enhance effectiveness of the lesson. Consequently, in the past 10 years alone, over 10 major new technologies for learning and collaboration have been introduced. Early experience with these technologies has uncovered opportunities for profound improvements in quality, effectiveness, convenience and cost of learning experiences. Thus, according to Prensky (2001) educational technology experts and others in education today are looking beyond the automation of traditional teaching models to new approaches to teaching and learning that are better aligned with the 21<sup>st</sup> century digital age that deliver measurable results. By focusing on what can improve learning, rather than the limitation of our resources, it offers an opportunity to fundamentally re-think how to design and deliver learning programs.

According to Young (2002) the use of e-technologies in education has received tremendous attention over the last few years, and the desire for it is likely to increase even more as the demand for teaching students efficiently and effectively continues to grow. Today's e-learning technology and applications are making more personalized education a reality at every level. Young (2002) added that customizable e-learning applications and high-speed internet browsing on individual or small group levels are leading to a more interesting, more in-depth, more personalized learning experience that is a major factor in increasing student performance. Only now that educators are beginning to understand how learning experiences will evolve to exploit "blended" combinations of both traditional and technology-based learning methods, and how blended learning can have a strategic impact on our educational system.

Leaders in the field of education pointed out that e-learning technologies can effectively respond to accelerating global competition, increase the quality of learning experiences, remove situational barriers, and be more cost effective (Daniel, 2000 & Young, 2002). In support of this, Rooney (2003) argued the need for pedagogical redesign with students recast in the role of socially active and collaborative learners so that they are engaged in sense making through internal reflection and external dialogue in both formal and informal learning activities. Buttressing this, Oliver and Goerke (2007) remarked that today's students are inhabitant of a world dominated by the use of information and communication technologies where the internet and mobile phone use are commonplace and where years of participation in interactive game play have generated skills linked to high-level visual, audio, digital, or new media literacies. To support this, Prensky (2001) remarked that learners within this environment effectively accommodate the 'language' of new technologies and its place in their world, and they are comfortable with it because it is, and always has been, part of their reiterated experience. This implies that many students entering higher education have the ability to articulate and create ideas using new technologies and can interpret the layers of meaning all multimodal digital environments may convey.

### **The Concept of Blended Learning Environment**

The precise origin of the term "blended learning" (BL) is uncertain, but according to Driscoll (2003) one of the first occurrences that have been identified is its use in a 1999 news release from Externally Collaborative, Project-based, Interdisciplinary Curricula (EPIC) for learning, an Atlanta-based computer skill certification and software training business. With the popular advent of Internet and the World Wide Web in the late 1990s, "Blended learning" (BL) appears to have been in use. However, the precise connotations of BL have continued to change to accommodate more internet based innovations and subsequently the nomenclature converged and stabilized as "Blended Learning". From 2006 to present, blended learning has been understood as a combination of face-to face and technology-mediated instructional forms and practices (Graham, 2006). In continuation, Graham (2006) remarked that the term *blended learning* is relatively new in higher education however; the most common position is that blended learning environments combine face-to-face instruction with technology-mediated instruction.

Face-to-face instruction involves interactions between instructors and learners who are in the same place, whereas technology-mediated instruction uses information and communication technologies (ICT) to mediate the learning experience and interactions without requiring that learners and instructors be located together. To clarify further on blended learning, Driscoll (2003) identifies four eclectic definitions as follows;

1. to combine or mix modes of web-based technology (e.g., live virtual classroom, self-paced instruction, collaborative learning, streaming video, audio, and text) to accomplish an educational goal.
2. to combine various pedagogical approaches (e.g., constructivism, behaviourism, cognitivism) to produce an optimal learning outcome with or without instructional technology.
3. to combine any form of instructional technology (e.g., videotape, CD-ROM, web-based training, film) with face-to-face instructor-led training.
4. to mix instructional technology with actual job tasks in order to create a harmonious effect of learning and working.

In fact, blended learning has been used to describe the mixing of delivery methods to students (distance and face to face, face to face and independent learning) as well as the combination of face-to-face instruction with various types of non classroom technology-mediated delivery (e.g., instructional television).

In its current guise, blended learning is most commonly associated with the combination of face-to-face and fully online components of a course (Young, 2002 & Rooney, 2003), yet the term has also been used to describe the combination of media and tools employed in an e-learning environment, as well as the combination of a number of pedagogic approaches within one course design, irrespective of learning technology used (Driscoll, 2003). As pointed out by Graham, (2006) there are three categories of blended learning systems based on the primary objective of the blend; thus:

- Enabling blends: In this category, blending is done by providing the same opportunity or learning experience but through a different mode where learners choose the option that meets their needs and time constraints.
- Enhancing blend: This is where blending is enhanced by adopting learning management systems that provide supplementary resources for courses that are mainly conducted face-to-face.
- Transforming blends: Here blending is done by utilising technology-mediated approaches to teaching as a main instruction method combined with traditional learning (Graham, 2006).

### Models of Blended Learning

There are many different models of how to provide blended learning to learners, and not all will be appropriate for all situations. To give some examples, Rossett and Frazee (2006) identify three models.

I. **“Anchor blend”**: This is where online instruction is provided after classroom instruction, so that learning is “anchored” in class-based practice. This is to help learners to understand the content, meet the demands of the course, and meet their teachers and peers, before they complete the online aspects of the course.

II. **“Bookend blend”**: This is pre-class online activities that prepare learners for face-to-face sessions. This is similar to the “flipped classroom” model where work is done before the class or workshop session and the class then focuses on discussing what has been learned. There is also a post-discussion online activity to ease the “transfer of learning”, i.e. the application of what's been learned outside the training learning environment.

III. **“Field blend”**: Here, online resources are provided for learners to make use of whenever they wish. This is very flexible for the learner, but provision is unstructured, so it may not be well-integrated with face-to-face teaching.

From these assumptions and models it is clear that a coherent programme of instruction can be created to redefine higher education in Nigeria, reduce situational barriers, strengthen flexible scheduling systems and increase access to education anywhere and at anytime. This is based on the belief that blended learning involves more than adopting new technology for teaching and learning, it is also about creating a coherent programme. In addition, Launer (2010) opined that “the technique used in a blended setting is as good as the teacher choosing it and tutoring the learning process,” and that it is important to find the right tool for a specific context.

### The Position of Higher Education in Nigeria and Rationale for Blended Learning

Higher education according to Okebukola (2008) is a post secondary education that provides high level human resources for driving the economy and ensuring rapid societal transformation. However, the current pedagogic practices commonly used in higher education in Nigeria as noted by Okebukola (2008) is the face to face mode of instructional delivery which is characterized by inadequate quality of teaching and capable of limiting access to Higher education. In the face to face mode of instruction, Okeke (2008) lamented that lessons are often scheduled for a limited space of time as such reducing the amount of interaction time between lecturer to students and student to student; limited number of students that can be accommodated for lectures and reducing the roles of the teacher to content provider who initiates the class, specifies the syllabus, and dictates the direction of the instruction.

In addition, Oliver and Goerke (2007) noted that the proliferation of blended learning approach over the past two decades, has offered new modes for teaching, learning and communication. Also it posed a great challenge to the continued dominance of traditional didactic pedagogy (with lecture as the main instructional strategy) in higher education because of its limitation in scope if compared to the demand of today's information age. Supporting this view, Prensky (2001) added that most students in higher educational institutions think and process information fundamentally different from their predecessors; they may not be satisfied with the traditional face to face approach of knowledge transmission. Prensky (2001) remarked that they would prefer to interact with the instructor and to be in constant communication with their peers, and learn best in highly customisable environments in which knowledge can be created and shared collaboratively. As a result of these submissions, adopting blended

learning as an appropriate pedagogic practice in Nigeria higher education most probably will solve problems of lack of collaboration, interactivity, information literacy and authenticity in student learning activities and make instruction more learner-centred, non-linear, and self-directed.

Ideals associated with blended learning tend to be based on constructivist learning principles as summarised by Launer (2010): "The constructivist approach assumes that learning process is highly individual and cannot be controlled but only enhanced from outside." In addition, blended learning complements this by offering "almost unlimited options for learning and teaching." Launer, (2010) sets out a number of ways in which blended learning can redefine learning processes in higher education:

- Blended learning is more flexible for learners: "learners can study at their own pace, slow down in the learning process where they lack knowledge or speed up and skip exercises when they feel confident".
- Blended learning encourages the role of teachers and learners to change, so that the learner becomes active managers of their own learning.
- Blended learning, in a high quality online (learning) environment, integrated with well-resourced support and training from teachers is capable of leading to a high quality learning experience.

Grenfell (2009) revealed that skill based activities if augmented with web-based problem-solving (blended learning environment) will enable active participation in both real and virtual-world e-learning. Forland and Divitini (2002) added that by integrating face-to-face classroom activities and online learning resources within a purpose-built blended learning environment, the social interactive aspects of a real world classroom can be replicated. This approach provides a virtual meeting place where learners who find it difficult to attend face-to-face classes due to employment, family, geographical or timetable constraints are able to collaborate with peers at times outside of normal class hours.

According to Dede (2005) blended learning environments are shared platforms that allow multiple simultaneous participants representing themselves through avatars to communicate with each other, interact with digital artefacts, and take part in immersive problem solving scenarios and simulations. This engagement enables a new realm of constructivist learning, enhancing collaborative and individual practice, enabling students to seamlessly use new technologies to access new ways of learning and present ideas or respond to core discussion themes (Prensky, 2001). Sharing the same view, Grenfell (2009) added that students have the capacity to talk and interact in real time, while sharing still or moving digital images, audio streams or adding to the digital infrastructure of the virtual environment, by engaging in art learning episodes and mounting simulated art exhibitions of their work. Blended learning can offer a higher level of interaction than commonly experienced in face to face courses; this is because the various technological tools available in many blended courses and learning management systems combine to form a communication environment with features such as facilitating access to course materials and experts that might not be otherwise available. Furthermore, some research studies have found that blended learning can improve student learning outcomes while lowering student attrition rates. Although success rates varied between disciplines, blended courses generally produced successful student learning outcome rates (Dziuban and Hartman, 2004).

### **Elements and designs of Blended Learning**

Blended learning approach differs according to the elements that are blended, the percentage of these elements in the course of study, and the objectives of the courses. Thus:

- Self-paced e-learning
- Webinars (Broadcast style with large groups)
- Mobile learning
- One-to-one coaching (face-to-face)
- One-to-one coaching (telephone/web)
- Virtual classrooms (with smaller groups)

## Design of blended learning

In blended learning, the face-to-face portion is conducted in an instructor-led classroom while the online learning portion could be provided as synchronous or asynchronous. Online synchronous design could be online chat, video-conferencing, and/or conference calls, and asynchronous design could be online discussion boards, online tutorials, and/or self-assessments, electronic texts, and emails. Asynchronous learning is self-paced, student-centred, and offers students learning materials that can be repeated at their convenience. According to Garrison and Kanuka (2004), there is a shortage in blended learning design that can be followed by instructors. Although, in the past, the ingredients for blended learning were limited to physical classroom formats (lectures, labs-- books or handouts). Today as noted by Garrison and Kanuka (2004) schools have myriad learning approaches to choose from, including but not limited to:

Synchronous physical formats such as:

- Instructor-led Classrooms & Lectures
- Hands-on Labs & Workshops
- Field Trips

Synchronous online formats (Live e-Learning) which include:

- e-Meetings
- Virtual Classrooms
- Web Seminars and Broadcasts
- Coaching
- Instant Messaging

Self-paced, asynchronous formats such as:

- Documents & Web Pages
- Web/Computer-Based Training Modules
- Assessments/Tests & Surveys
- Simulations
- Job Aids & Electronic Performance Support Systems (EPSS)
- Recorded live events
- Online Learning Communities and Discussion Forums

By employing these technologies for designing and developing blended learning environments, Okeke (2008) remarked that educators can better stimulate active involvement in experiential and authentic learning, help elicit learner participation beyond expectations as active learners and expand the breadth and depth of the curriculum to a great extent. For example, students can now access information beyond the scope of their instructors and traditional textbooks. Indeed, blended learning has the potential to enhance knowledge construction and to equip today's learners with the kind of skills required for the aspects of their lives, rather than just focusing on content mastery, thus bringing about a transformation in the higher education landscape.

## Creating the right blend of learning environment

According to Khans (2007) a variety of factors are required to be addressed in order to create a meaningful learning environment. Many of these factors are interrelated and interdependent. A systematic understanding of these factors can enable designers to create meaningful distributed learning environments. Khan's octagonal framework as in (Fig. 1) serves as a guide to plan, develop, deliver, manage, and evaluate blended learning program. The framework has eight dimensions which include: institutional, pedagogical, technological, interface design, evaluation, management, resource support, and ethical.



Figure 1. Khan's Octagonal Framework

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.

**Institutional:** The Institutional dimension addresses issues concerning organizational, administrative, academic affairs, and student services. Personnel involved in the planning of a learning program could ask questions related to the preparedness of the faculty or department, availability of content and infrastructure, and learners' needs.

**Pedagogical:** The Pedagogical dimension is concerned with the combination of content that has to be delivered (content analysis), the learner needs (audience analysis), and learning objectives (goal analysis). This dimension addresses a scenario where all learning goals in a given course are listed and then the most appropriate delivery method is chosen. For example, if a learner is expected to demonstrate a skill (in graphic design or computing), then using video or animation as part of the blend is appropriate. If a learner is expected to develop a speaking skill for a seminar presentation, then using a discussion as one of the elements in the blend would be an appropriate choice.

**Technological:** Technology issues that need to be address include: creating a learning environment and the tools to deliver the learning program such as learning management system (LMS), learning content management system (LCMS) that catalogs the actual content (online content modules) for the learning program. Technical requirements, such as the server that supports the learning program, access to the server, bandwidth and accessibility, security, and other hardware, software, and infrastructure issues also need to be addressed.

**Interface Design:** The Interface Design dimension addresses factors related to the user interface of each element in the blended learning program. One needs to ensure that the user interface supports all the elements of the blend such as content structure, navigation, graphics, and *help*. For example, in a higher education course, students may study online and then attend a lecture with the professor. The blended learning course should allow students to assimilate both the online learning and the lecture equally well.

**Evaluation:** The Evaluation dimension is concerned with the ability of the program to evaluate how effective a learning program has been as well as evaluating the performance of each learner. In a blended learning program, the appropriate evaluation method should be used for each delivery type.

**Management:** The Management dimension deals with issues related to the management of a blended learning program, such as infrastructure and logistics to manage multiple delivery types, registration and notification, and scheduling of the different elements of the blend.

**Resource Support:** The Resource Support dimension deals with making different types of resources (offline and online) available for learners as well as organizing them. Resource support could also be a counsellor/tutor always available in person, via e-mail, or on a chat system.

**Ethical:** The Ethical dimension identifies the ethical issues that need to be addressed when developing a blended learning program. Issues such as equal opportunity, cultural diversity, authenticity of the content and nationality are address.

### **Challenges of blended learning**

This section uncovers challenges that Nigeria universities may face when adopting and implementing blended learning.

1. **Cultural paradigm:** Adopting blended learning in the midst of traditional university culture is one major challenge to be considered in its implementation. Specifically, the issues that are likely to arise are not unconnected to the comfort levels among instructors and the students alike. For example, Instructors may entertain fear of uncertainties of the use of technology in education; technology failure; power failure; poor internet signals; Instructors skills and time for the preparation of online instructions and a

strong resistance to change among instructors and students. On the other hand, Graham, Allen, and U... (2003) revealed that students' level of self-discipline, organisational and managerial support; students' responsiveness to follow the online instruction on their own and societal norms and values are also part of the challenges.

**2. Design frameworks:** The flexibility of blended learning addresses varying design needs, the blended learning requires an intentional approach to instructional design frameworks that could be used as guidelines. Also producing effective and interactive digital contents is a challenge to instructors, this is because, the design process are critical to the effect the course will have on the learner. Despite a wide variety of delivery mediums, choosing the best combination of technology is a daunting task for many instructors.

**3. Bandwidth access:** The negative experience people had (including students and instructors) over the use of internet in Nigeria may be a challenge in adopting blended learning. The story of "poor signals", "no network connection", "network fail" "try again" is a daily occurrence among internet users.

**4. Demand on time:** The time required by instructors who implement blended courses will increase because they must develop digital content and moderate online learning. Transforming traditional courses into blended courses will require more instructor time than developing traditional courses because of the necessity of redesigning the course. Moreover, instructors and students typically incur an increase in the time they spend on learning new techniques and skills, and on interacting with each other in blended learning environments.

**5. Procurement and maintenance:** High cost of technology gadgets and accessories coupled with Nigeria's poor maintenance culture may likely pose a challenge to the successful implementation of blended learning.

### Conclusion

Adopting blended learning in Nigeria higher education system requires thorough exploration of successful stories of blended learning and to identify specific challenges related to the context and the environment. The status of higher education in Nigeria as noted by Okebukola (2008) is not something to smile at, class size is one variable that negatively affect active participation and interaction in a classroom based learning. Teachers in larger classrooms have no other option than to resort to more lecture-based teaching where students have less opportunity to participate, thus making it easier for students to remain anonymous (Nsofor, 2010). Adopting blended learning as a supplement to classroom based learning can be an added spice to students learning experience and can further redefined higher education in Nigeria. Consequently upon this, the following recommendations are proffered.

### Recommendations

- Academic institutions should provide facilities such as student computer laboratories and internet connectivity that can support blended learning environment for both instructors and students. In addition, making required online materials asynchronous instead of synchronous is preferred in order to overcome the challenge of bandwidth access.
- It is recommended that only 25-50% of the course of study to originate from web-based instruction. This percentage is stipulated in order to retain the advantages of face-to-face instruction.
- The management of higher institutions should organise an intensive instructor training programmes, and a series of easy to use curriculum design ideas for instructors.
- Instructors should adjust their schedules to accommodate more frequent interaction with students who generally expect more frequent feedback in online environments than in face-to-face environments.

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