

# INTEGRATION OF INFORMATION AND COMMUNICATION TECHNOLOGY INTO THE TEACHING AND LEARNING PROCESS



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## Chapter Three

### **E-LEARNING: NEW TECHNOLOGIES, NEW PEDAGOGIES**

Abdalla Uba Adamu

#### **Introduction**

Electronic learning appears to be the first recognized term to specifically connect learning with modern technologies of communication (Crompton 2013)—a radical reinterpretation of the purposes of technological devices. Early definitions by Pinkwart, Hoppe, Milrad and Perez (2003) simply describe such e-learning as learning supported by electronic media and tools. This is a next step to learning using the old ‘instructional technology’ of tape decks, slide photos, film reels and projectors, and OHP transparencies. e-Learning places a whole new concept on ‘instructional technology’ by investing more independence on the learner.

Thus the use of e-learning within educational, and most significantly, training, contexts, refers to a wide variety of delivery strategies that make the maximum use of Information and Communication Technologies (ICTs) to deliver content. The noughties have brought with them increasing ease of use of ICTs in every form and structure, and right before the Internet revolution, training institutions have taken advantage of the backbone offered by the new technology to deliver faster, more accurate and more efficient information to learners. The various delivery methods serve different purposes for the learner, and learners may do better using a particular method over another. For example, someone who has a high level of self-discipline, coupled with a strong desire to learn may do well in a self-paced study program. Other learners may do better with live interaction through chat groups, message boards, or regular instructor communication to maintain motivation and provide a "real world" feel to e-learning.

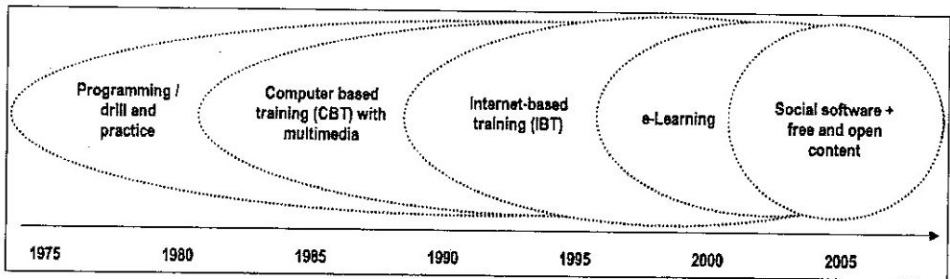
This paper explains stages in the development of e-learning and the types of e-learning. It also provides a model for an effective e-learning practice and expounds an e-learning tablet revolution that is occurring in Nigeria.

#### **Stages in the Development of e-Learning**

e-Learning as a concept has garnered significant global attention (Gotschall, 2000; Hall, 1997). Though the history of e-Learning (primarily distance learning) dates to the early 1950's and even before (Saba, 1998; Clark, 2000; Rosenberg, 2001), not until the last eight years has it become a momentous, collective imperative of several entities.

Given the diversity in the use of e-learning terminology, it is important to verify what people mean when they use any of these terms. Two people might use the same term to mean very different things. The term online learning, for example, might refer to any of the four types outlined here. When someone uses the terms online learning, e-learning, distributed learning, or distance learning, you cannot be certain what they mean. These

terms and their dovetailing into a specific strategy called e-learning were evolutionary stages in the development of Information and Communication Technologies that provide the central backbone of the e-learning philosophy. These stages are given in the figure below.



**Fig. 1 – Stages in the development of e-Learning**

### *Instructor-Led Training (Pre-1983)*

Before computers were widely available, instructor-led training (ILT) was the primary training method. ILT allowed students to get away from the office to focus on their studies and to interact with their instructor and classmates. However, ILT usually meant high costs and downtime during office hours, leading training providers to search for better way to train.

### *Multimedia Era (1984-1993)*

Windows 3.1, Macintosh, CD-ROMs, PowerPoint. These were the technological advancements of the Multimedia era. In an attempt to make training more transportable and visually engaging, computer-based training (CBT) courses were delivered via CD-ROM. The anytime, anywhere availability of CD-ROMs also provided time and cost savings that instructor-led training (ILT) could not, and helped reshape the training industry. Despite these benefits, CD-ROM courses lacked instructor interaction and dynamic presentations – making the technology too dependent on their competencies and technologies.

### *First Wave e-Learning (1994-1999)*

As the Web evolved, training providers began exploring how this new technology could improve training. The advent of email, Web browsers, HTML, media players, low-fidelity streamed audio/video, and simple JAVA began to change the face of multimedia training. Basic mentoring via email, intranet CBT with text and simple graphics, and Web-based training with low-quality intermittent delivery Web casts emerged.

The availability of technologically mediated forms of learning simply introduces, it could be argued, some additional decisions for the practitioner: from the technologies available for use, which should be used, when and with whom?

### ***Second Wave e-Learning (2000-Beyond)***

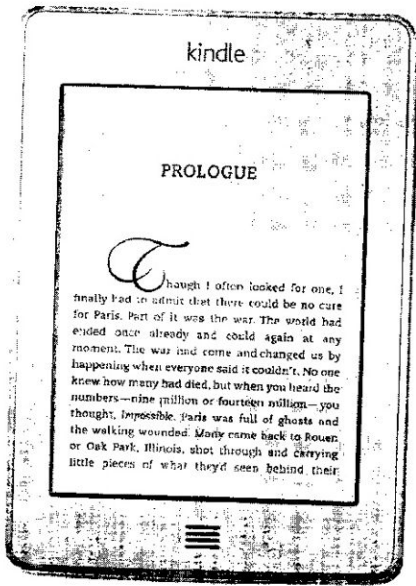
Technological advances -including JAVA/IP network applications, rich streaming media, high-bandwidth, and advanced Web site design -are revolutionizing the training industry. Today, live instructor-led training (ILT) via the Web can be combined with real-time mentoring, improved learner services, and up-to-date, engaging, "born on the Web" content to create a highly-effective, multi-dimensional learning environment.

### **The Tablet and iPad Era**

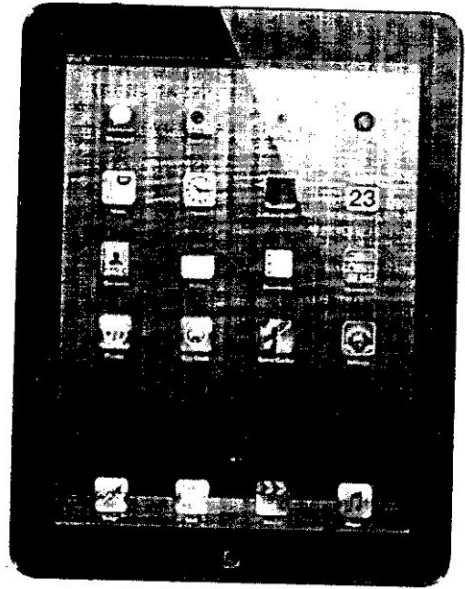
By 2013 tablet computers have entered the e-Learning arena firmly. A tablet computer, or simply tablet, is a mobile computer with display, circuitry and battery in a single unit. Tablets are equipped with sensors, including cameras, microphone, accelerometer and touchscreen, with finger or stylus gestures replacing computer mouse and keyboard. Tablets may include physical buttons, e.g., to control basic features such as speaker volume and power and ports for network communications and to charge the battery. An on-screen, pop-up virtual keyboard is usually used for typing. Tablets are typically larger than smart phones or personal digital assistants at 7 inches (18 cm) or larger, measured diagonally.

Today's tablets use capacitive touchscreens with multi-touch, unlike earlier stylus-driven resistive touchscreen devices. After 2010, multi-touch and other natural user interface features, as well as flash memory solid state storage and "instant on" warm-booting; external USB and Bluetooth keyboards defined tablets. Some have 3G mobile telephony applications.

While there were many early tablets that were used for educational purposes, the most convenient and cheapest to come to the market was the Amazon Kindle which debuted in 2007. Its massive success led to Apple Inc. coming up with the first iPad in April 3, 2010. Fig 2 shows the two pioneer contemporary tablets.



Amazon's Kindle (2007)



Apple's iPad (2010)

Fig. 2 – New Technologies in e-Learning

These two devices have revolutionized not only how classrooms are managed, but also how content is delivered to the students. Indeed the dilemma facing educational policy makers in countries such as the United States, UK, Thailand, and Turkey is not whether to use tablets or not in education, but *which* particular tablet to be used—indicating widespread acceptance of the devices that is in tune with contemporary realities of learners plugged to technology. Such widespread acceptance is reflected, for instance in Thailand, where Jamie Yap reported that the Thai government plans to provide 7 million tablet computers for schools in 2014 (Jap 2013) as part of the 'one-tablet per child' educational policy of the country.

### Types of e-Learning

e-Learning means different things to different people. There are, however, common elements to the variety of understandings one can have about e-learning. Within the context of the practice of e-learning, it can be defined as

...the continuous assimilation of knowledge and skills by adults stimulated by synchronous and asynchronous learning events—and sometimes Knowledge Management outputs—which are authored, delivered, engaged with, supported, and administered using Internet technologies (Morrison 2003:1).

**This** definition of e-learning provides a variety of methodologies for delivery. These include:

- a) The convergence of the Internet and learning, or Internet-enabled learning.
- b) The use of network technologies to create, foster, deliver, and facilitate learning, anytime and anywhere.
- c) The delivery of individualized, comprehensive, dynamic learning content in real time, aiding the development of communities of knowledge, linking learners and practitioners with experts.
- d) A phenomenon delivering accountability, accessibility, and opportunity to allow people and organizations to keep up with the rapid changes that define the Internet world.
- e) A force that gives people and organizations the competitive edge to allow them to keep ahead of the rapidly changing global economy.

With good design and delivery, e-learning does all these things. But, at its heart, it is, simply, learning. According to Broadbent (2002:14), there are at least four identified strategies to characterize the process, rather than the delivery mechanism, of e-learning. These are:

1. Informal,
2. Self-paced,
3. Leader-led, and
4. Performance support tools.

In informal learning, a learner accesses a Web site or focused online community and finds pertinent information. This type of e-learning is not training because it does not include a formal instructional strategy consisting of a presentation of material, application exercises, and feedback.

Self-paced learning refers to the process whereby learners access computer-based (CBT) or Web-based (WBT) training materials at their own pace, normally on a CD-ROM for CBT or over a network or the Internet for WBT. Learners select what they wish to learn, decide when they will learn it, and set the pace they wish.

Unlike self-paced, leader-led e-learning always involves an instructor, coach, or facilitator. There are two basic forms: (1) learners access real-time (synchronous) materials via videoconferencing or an audio or text messaging service such as chat, or (2) learners access delayed materials (asynchronous) through threaded discussions or streamed audio or video.

Performance support tools is the fourth type of e-learning. This is an umbrella term for online materials that learners access to gain help in performing a task, normally in software. Performance support tools normally lead the user through the steps required to perform a task.

In the final analysis though, the categories of e-learning strategies are either self-paced or synchronous. Table 1 compares the two:

	<b>Self-Paced</b>	<b>Synchronous</b>
Learning Environment	Tutorial	Virtual classroom
Training Delivery	Recorded media (CBT, WBT, audio/video)	Live presentation
Software Required	Web-browser or courseware reader	Courseware or conference-ware application
Instructor	No (mentor or help desk may be available)	Yes (may also be an assistant instructor or technologist)
Training Location	Learner's desktop	Learner's desktop
Course Delivery	Whenever the user accesses	Courses scheduled and announced
Class Size	Individual	Varies

There also are e-learning hybrids created from combining the four pure types, plus the so-called blended types, consisting of conventional and e-learning methods.

The terms cited above are not universally or consistently used. And some are used interchangeably. Informal learning is also known as performance support, informal e-learning, online documentation, multimedia, Web site, hub, or portal, and online learning. Self-paced e-learning is also called self-study, WBT, CBT, multimedia, distance learning, distributed learning, and online learning. Leader-led e-learning is also known as instructor-led learning, ILT, e-ILT, WBT, online distance education, distance learning, distributed learning, and online learning. Performance support tools are sometimes called electronic performance support systems (EPSS), wizards, online help, and online learning—to name a few.

Thus as learning facilitated and supported through the use of information and communications technology, e-learning may involve the use of some, or all, of the following technologies:

- a) desktop and laptop computers
- b) software, including assistive software
- c) interactive whiteboards
- d) digital cameras
- e) mobile and wireless tools, including mobile phones
- f) electronic communication tools, including email, discussion boards, chat facilities and video conferencing
- g) Virtual Learning Environments (VLEs)
- h) learning activity management systems



Exploring the concept of effective practice in either 'e-', or other types of learning, begins with an understanding of the term 'pedagogy'. Formerly restricted to erudite usage, the term is now used with increasing confidence and panache by those who discuss and debate educational principles.

However, it is important that those involved in learning and teaching have as much ownership of this term as those who direct, control and manage the institutions in which practitioners practice their art. Defined as 'the activities of educating, or instructing or teaching' and 'activities that impart knowledge or skill', pedagogy implies a very special skill, for which the term 'art' is not misplaced, although the efficacy of that art may be put to the test through statistical methods. Once defined as an art, the role of the practitioner can be viewed as essentially creative and the term 'pedagogy' (literally in Ancient Greek 'a guide who took a boy to school') can be used to explore the nature of the skills involved.

As a starting point, judgments about effective practice with e-learning can be based on the same criteria as judgments about effective practice in learning generally – that the practice should:

- a) engage learners in the learning process
- b) encourage independent learning skills
- c) develop learners' skills and knowledge
- d) motivate further learning

And in the broadest sense, effective learning is likely to occur when opportunities to learn involve:

- a) the right resources
- b) the right mode (or blend of modes) of delivery
- c) the right context
- d) the right learners
- e) with the right level of support

This is captured in Fig. 3 that shows the various pathways in effective utilization of the pedagogical principles in e-learning.

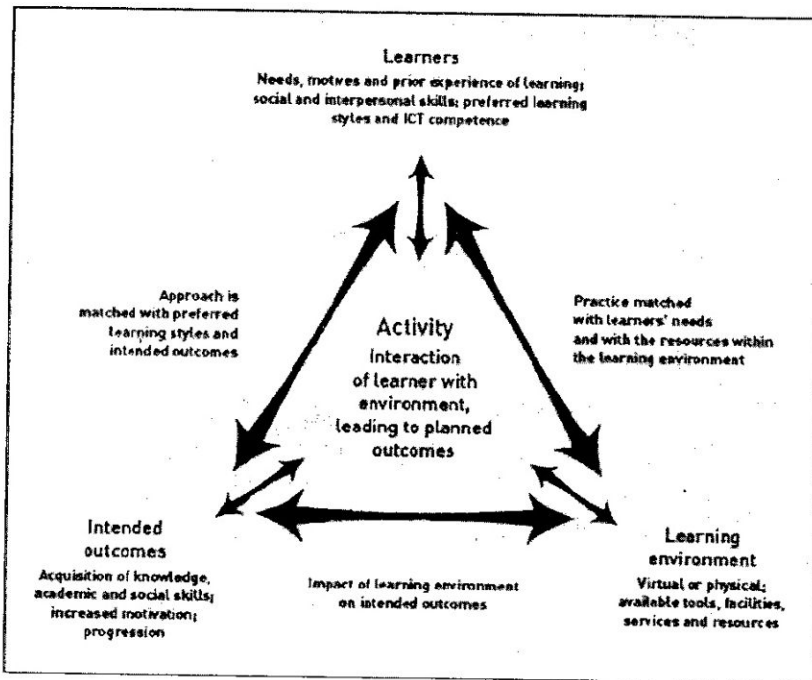


Fig. 3 - Pedagogical Principles in e-Learning Model

Bringing about effective learning, however, is a complex and creative process which involves identifying objectives, recognizing the needs of the learners, selecting the most suitable approach, and then striking an appropriate balance between e-learning and other modes of delivery when working within a technology-rich context (one in which practitioners can choose between e-learning and traditional options).

### Goals for e-learning

The world of e-learning is continuously evolving and presenting new challenges, so instructional tools must successfully meet current challenges. The following are goals to create successful e-learning offerings:

- a) Ensure that client needs are correctly identified and that final training is appropriate and effective.
- b) Ensure that content supports adult learner characteristics and motivation.
- c) Develop instructional strategies, based on instructionally sound models and methods that are appropriate for a virtual environment.
- d) Develops clear and effective guidelines for all instructional strategies that can be easily and consistently used among all instructional designers.
- e) Create granular, stand-alone pieces of content based on a learning object architecture.

- f) Create content that can be easily updated to support client needs. During the update process, the majority of the content should remain viable and the update process should be cost effective.
- g) Implement a course content structure that is easy to use and access. Content will need to be updated and clients might have in-house staff to make the updates.
- h) Ensure that course design is flexible. Instructional strategies must be easy to modify according to client need.
- i) Develop instructional strategies that work within bandwidth sensitive requirements and still result in highly interactive and engaging courseware.

### **Distance and online education**

Discussions about e-learning sometimes focus on fully online environments and the idea of virtual institutions, as if all e-learners are distance students. While online education and distance education share many commonalities, there are also some important differences between the two.

Online learning is when the students use their computer to access their course. This might (but does not have to) mean that the students do not need to be physically present on campus to participate in the course. They might work with course materials at their own convenience, or they might work collaboratively on class projects using tools like chat and discussion groups.

However, online learning needs not occur at a distance, and distance learning needs not utilize any e-learning approaches. Both are different from conventional campus-based instructional design. Online learning, like distance education, requires detailed specification of learner needs, learning objectives, learning materials, activities, delivery methods, and resources required. The matching and integration of pedagogical approaches with the information technologies is a complex process that requires a team approach. It also takes significantly more time than the pre-course preparation required for face-to-face delivery.

The literature suggests that there are three common reasons students choose distance education. They are convenience, flexibility and adaptability to individual needs. All of these may also be reasons for choosing online learning.

Online education is seen by many as being different to distance education because of its potential for interaction (Campbell cited in Nixon, 2004). Online interaction can be synchronous (involve real time interaction) through chat rooms and video-conferencing, or it can be asynchronous (interaction that takes place at different times for different students as they access material by email, websites, and voicemail). Such technologies, while not standard in distance education, are also sometimes used to support print-based distance courses and classroom-based courses.

Thus while e-learning can be used as part of distance learning programs, it does not necessarily have to involve distance learning. It is important to note here that in

conventional classroom settings the relationship between the teacher and learner is regarded by many as critical to the success of the learner.

Similarly, fully online organizations or programs differ profoundly from conventional educational contexts. There is no “natural” progression from conventional to online forms of delivery. The two environments are quite different—for learners and for teachers.

In the literature on e-learning a number of other important distinctions are made, some of which are outlined below.

### *Blended or hybrid learning*

Blended or hybrid learning is a term that means a combination of online and conventional face-to-face classroom-based teaching and learning (see, for example, Darby, 2003; or Proctor, 2003).

For example, lectures could be replaced by online learning materials and activities which the students worked through in their own time, at their own pace, but continued to take part in regular face-to-face tutorials or workshops with their teacher.

### *Flexible learning*

The term “flexible learning” is commonly used in Australia to refer to learner choice, learners being able to make decisions about when, how, in what order, for how long, and where they will study (see for example, Collis & Moonen, 2001). According to the definition on the Australian Flexible Learning Frameworks website:

Flexible learning expands choice on what, when, where and how people learn. It supports different styles of learning, including e-learning (<http://flexiblelearning.net.au/>).

The ultimate intention of flexible learning is to provide learners with choice as to what they learn, where they learn it, how they learn it, and at what pace they learn. Recognition will be made of diverse pathways including work in other educational institutions. There are few examples of fully flexible learning programs, but many examples of programs with flexible components.

The use of e-learning enables learners to access ‘lectures’ and ‘tutorials’ asynchronously, at times that suit them and that allow them to pursue learning while remaining employed, in locations without tertiary institutions, or being responsible for family. E-learning can also open up different avenues for formative assessment, for example, the use of online quizzes linked to further review material that can be taken by learners when they feel ready, or want further practice. Students can move quickly through modules they are comfortable with, and spend longer with areas of difficulty. Examples, activities **and links** to further information and resources can be given (and shared between students, and between students and teachers) that cover a range of student interests and prior knowledge.

## ***Other Terms***

Some other terms that are used to refer to e-learning include computer mediated learning, distributed learning, online learning, net-worked learning, virtual learning, Web-based learning, and digital learning. These terms are often used interchangeably or with partly overlapping meanings.

## **Critical Success Factors**

Some of the literature on the effectiveness of e-learning programs uses the term “critical success factors” (CSF). This term, critical success factors, originated in the field of management. It refers to the personal and individual factors that are essential if an organization is to be successful in achieving its goals (Daniel, 1961; Rockart, 1982). CSFs are defined as those areas that an organization must get right or it will not succeed.

The concept of CSFs has been adapted to a variety of settings, and there are a number of reports of CSF approaches in change management projects, and “best practice” studies particularly in relation to information and communications technology. CSF approaches seek to identify a small number of factors that are in the “must get right” category. Rockart (1982) developed a CSF methodology to define the crucial elements required for the successful performance of an information specialist. This methodology involves a three-stage process involving focus groups or interviews with the target audience. The three stages are:

Stage 1: Identification of goals and objectives of the organization.

Stage 2: Identification of the CSFs required to achieve the goals and objectives.

Stage 3: Determination of how achievement would be measured.

CSFs can be considered at a range of levels, such as organizational, departmental or unit, or at the level of an individual’s role. The strength of the CSF approach lies in focusing attention on the tasks and activities which must be right if goals and objectives are to be achieved (Bullen, 1995).

Adopting this process for educational settings might take the following form:

Stage 1: Identify the learners’ goals through a process of needs analysis.

Stage 2: i. assess what the learners are currently able to do;

ii. analyze what has to be achieved to move them from their current position to their identified goals; and

iii. specify what is necessary to make this happen.

Stage 3: Decide how to identify and measure whether or not learners’ goals are achieved.

The Stage 2 (iii) is the point at which the critical success factors need to be identified and built into the teaching and learning environment. This process can take place at the level of a teacher and the class of students, and at various levels up through the institution, where

community needs are identified. At the sector level, learner goals are considered from a national perspective.

### A Model of Effective Practice with e-Learning

It is clear that the benefits of using technologies in an informed and pedagogically sound way can be felt across all sectors, as practitioners contribute to the body of knowledge and understanding of effective practice with e-learning. It is also suggested that designing for learning must increasingly incorporate decisions about where and when to integrate elements of e-learning into a program, course or individual session, wherever the learning environment can support this.

However, this is still an evolving story rather than a completed one especially in a technologically challenging environment like Nigerian Colleges of Education and Universities. As such various parameters need to be taken into consideration when implementing e-Learning. Fig. 4 provides a possible outline of the various linkages to make such process successful.

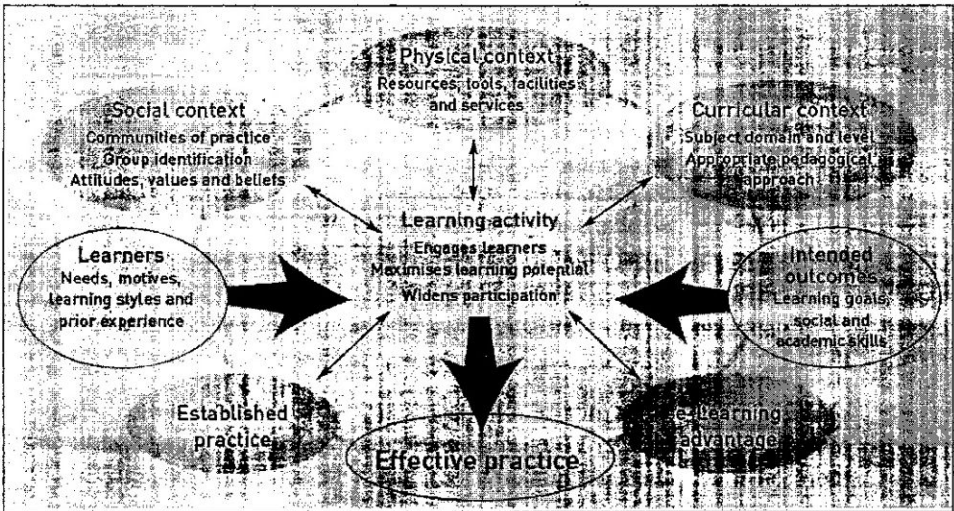


Fig 4 – Linkages Needed for Successful e-Learning

### The Advantages of e-Learning

Combine e-learning options with the best of established practice and the practitioner has greater capacity to create an exciting and meaningful learning experience.

The search for effective pedagogy is of key importance since the need to excite learners' interests, retain them on courses and enable their progression is vital to institutions and practitioners as well as to the learners themselves. Practitioners and learners both need to acquire, and be able to deploy, a set of skills as the situation demands.

e-Learning may in some contexts be the only 'card' that can be used, but more frequently, it is an option that extends the range and power of delivery, and a technique that can enable ~~more active learning for~~ a wider variety of learners. By placing e-learning options alongside established practice, it should be possible for individuals designing learning activities to choose which will give them the strongest advantage. Effective practice with e-learning will be based on three key principles:

- i. Designing effective learning activities involves decisions which appropriately reflect the needs of learners, the nature of the learning environment and the intended learning outcomes.
- ii. Effective practice matches learners' needs with tools and resources within the learning environment, the approach taken reflects learners' preferences and abilities, and matches these to the intended outcomes.
- iii. Where the e-learning option is used, it extends learning potential and is not used for its own sake.

From these, we can deduce that there are a number of benefits to learning online that are unique to the medium:

- a) *Any time.* A participant can access the learning program at any time that is convenient –not just during the specific 1-3-hour period that is set for a conventional course. The episodes can be quick snatches at odd times or long late-night sessions. Cross-time-zone communication, difficult to arrange in real time, is as easy as talking to someone across town when using the Internet.
- b) *Any place.* The participants do not have to meet. That means they can be anywhere. International sharing is feasible. Individuals can log on at work, home, the library, in a community learning center or from their hotel when traveling.
- c) *Asynchronous interaction.* Unlike face-to-face or telephone conversations, electronic mail does not require participants to respond immediately. As a result, interactions can be more succinct and to-the-point, discussion can stay more on-track, and people can get a chance to craft their responses. This can lead to more thoughtful and creative conversations.
- d) *Group collaboration.* Electronic messaging creates new opportunities for groups to work together, creating shared electronic conversations that can be thoughtful and more permanent than voice conversations. Sometimes aided by on-line moderators, these net seminars can be powerful for learning and problem-solving.
- e) *New educational approaches.* Many new options and learning strategies become economically feasible through online courses. For instance, the technology makes it feasible to utilize faculty anywhere in the world and to put together faculty teams that include master teachers, researchers, scientists, and experienced professional developers. Online courses also can provide unique opportunities for teachers to share innovations in their own work with the immediate support of electronic groups and expert faculty.

- f) *Integration of computers.* The online learner has access to a computer, so computer applications can be used without excluding some participants. This means, for instance, that a mathematical model implemented in a spreadsheet can easily be incorporated into a lesson and downloaded so all participants can run, explore, and refine the model and then share their findings and improvements.

## **The Nigerian Tablet Revolution – Opon Imo**

In Nigeria, the first State to take advantage of the tablet revolution was Osun State, under the leadership of Governor Rauf Aregbesola. The State's ICT strategy, possibly the first in Africa, revolves around what it calls the Opon Imo Initiative. The State, through the Opon Imo Technology Enhanced Learning System (OTELS), developed a learning tool that could revolutionize learning in developing states around the world. Opon Imo means 'tablet of knowledge'.

The Opon Imo is a standalone e-learning tablet that provides senior secondary students in Osun State with the learning materials required to prepare for school leaving examinations. It provides three major content categories: *Text Books*, *Tutorials* and *Practice Questions*. A total of 150,000 of these tablets were distributed to all senior secondary students across state schools in a move that is expected to radically democratize 'access' to learning, regardless of means, location or status. The devices are 'free to use' while the students remain in school. They hand them over when collecting their results so that the devices can be used by another set of students.

Opon Imo delivers compelling self-paced standalone courses, conducted in a highly interactive computer-based learning environment and synchronized to a library of relevant e-books and a computer-based testing environment. The device tackles the learning problem using contemporary ICTs, indigenous content while taking into account socially embedded factors accordingly. The tablet is a portable electronic device, which is controlled through its touchscreen interface, and is available across the open source Android operating system—perhaps the most dominant mobile phone operating system at the moment; so students would already be familiar with it.

Opon Imo's Virtual Classroom consists of 17 subjects for Senior Secondary 1, 2 and 3, and has a total of 51 video tutorials. There are 823 chapters in total with about 900 minutes (or 15 hours) of audio voiceovers and an average of 16 chapters per course.

The Integrated Test Zone makes available Mock Exam tests for 14 core subjects in WASSCE comprising of 10 years of past questions with an average of 500 questions each and approximately 1800 images. There are Practice tests for 46 courses with approximately 1220 chapters containing approximately 29,000 questions referencing approximately 825 images. In addition to all these, the 'tablet of knowledge' also has a Dictionary, Bible, Qur'an and Health book. It also has development games such as Chess, Sudoku and Tetris. It has 512MB of RAM and an internal storage capacity of 32GB.



As it is structured, Opon Imo ensures that each student has an e-textbook not only in all the subjects he is taking, but also on every subject offered at secondary level. This in itself is revolutionary. Thus a Science student, who has interest in literature and does not offer it, can still dip into literature texts at his leisure. In the same way, an arts student can learn about scientific concepts that intrigue him, purely for knowledge's sake. Fig. 5 shows a picture of device in various formations.

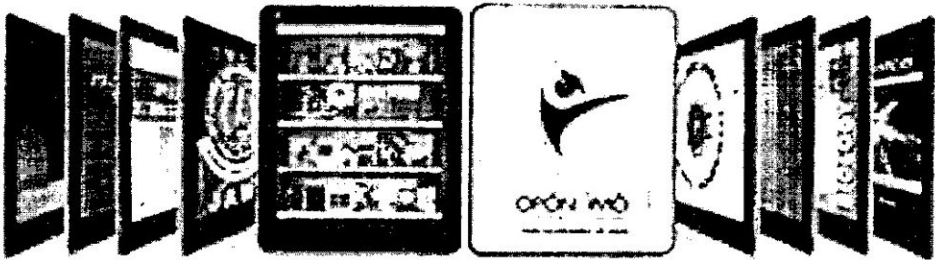


Fig. 5 – Osun State's Opon Imo, the Tablet of Knowledge

With all these, perhaps it was not surprising that the Opon Imo was recognized as one of the four e-Learning devices across the world at the World Summit Award Global Congress on E-Content and Creativity in Sri Lanka in 2013.

## Conclusions

Considering the explosion in consumer electronics and the way mobile computing and communication have liberalized access to information, today's technology has clearly demonstrated that e-Learning is one of the most cost effective ways of delivering content to students under varying learning circumstances. The spectacular success of Osun State's Opon Imo has demonstrated that e-Learning is achievable even in the most difficult circumstances; and the packaging of the process using a learning tablet has clearly demonstrated how the needs of contemporary technology-savvy students can be addressed through appropriate educational content provision.

There are issues that must be faced, though. The learning environment prides in its human-to-human interactivity. e-Learning strategies reduce this interactivity and create a more isolated learning situation—cutting off the teachers from their students. This basic lack of human touch is alien to African social systems, and the massive adoption of e-Learning is yet to come up with strategies for countering this isolation.

Additionally, in most African societies, technology tends to be urban-based. e-Learning may not have the same impact in rural areas as it would have in urban areas. The availability of 'tablet of knowledge' clearly demonstrates that e-Learning can reach to rural areas due to its portability—replacing computers easily, and doing away with computer related problems such as power supplies. However, rural dwellers might not immediately

grasp the technology as easily as their urban counterparts. This might lead to alienation and eventually, rejection; thus defeating the purpose of the initiatives.

Finally, e-Learning does not have a specific approach to learning – using multiple approaches from individualized instruction to guided instruction. This ignores the individual needs of students who may benefit from specific approaches to learning engagements due to their peculiar learning circumstances. Further, the lack of scheduled organizational approach to e-Learning can confuse learners used to rigid compartmentalization of learning periods.

Engaging students, minimizing technical problems, providing sufficient interaction while not overtaxing teachers, and framing interaction so that it enriches learning and creates a sense of group or learning community are fundamental to effective e-learning and need to be the top priorities in setting up and reviewing e-learning provision in educational settings.

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