Students' Learning Experiences Using Internet-Radio and Blended Learning Model During and Post-Pandemic Era

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ABSTRACT

This paper focuses on the utilization of internet-radio and social networking services as a blended tool for traditional learning to provide students with a total learning model. It examines how internet radio can be used within a blended learning model to provide students with a total learning concept. To achieve this, various blended learning benefits were identified and technical aspects of the internet radio-blended learning model are highlighted. Minimum equipment required to set up an educational internet-radio system as Radio Hosting Providers (the organizations that are globally licensed to host internet radio broadcasting services) among which are Studio Based Radio Server, Mobile Station Server, Pop Filter, etc. are looking into, elucidates in this paper are some of the benefits that can be derived from Internet-radio as an educational broadcasting tool and Internet Radio–Blended Learning model. It is concluded that internet-radio blended with learning will bring enormous improvement in the students learning activities and based on this, the use of the internet radio-blended learning model is recommended as a teaching and learning method for Higher Education Institutions in developing countries like Nigeria to complement their learning program most especially during and after an emergency period like COVID 19 pandemic.

Keywords: E-learning, Blended Learning, Traditional Learning, Internet Radio.

1. INTRODUCTION

It is widely known that rapid changes in advancement and innovation in science and Information Technology (IT) have been dictating the ways that those educators and teachers deliver the learning content and materials to achieve learning objectives. This is credited to the emergence of E-learning as advanced technology in providing learning and development in higher education (Lim et al. (2019)). E-learning which is commonly used interchangeably with online learning, cyber learning, or virtual learning according to Watson & Kalmon, (2005) as reported by Barbour, et. al. (2011) is an education in which instruction and content are delivered primarily over the Internet and which does not entails broadcast television or radio, print-based correspondence education, video cassettes and stand-alone educational software programs that do not have a

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significant Internet-based instructional component. However, E-learning is affected by factors such as lack of social interaction; the need for the knowledge of computer and internet skills; soft skills that cannot be taught via e-learning, and it is difficult to engage some students in productive and meaningful practical oriented work in the e-learning environment, and many more. These limitations give birth to a new approach called 'blended learning' (Khan, (2005)).

Blended learning is a form of a hybrid approach to learning that involves the combination of the fully online and face-to-face modes of instruction and learning ((Lim et al. (2019)). This approach offers the most flexible and scalable route to e-learning. Blended learning according to Khan, (2005) has many benefits which include- enabling learning groups to use multimedia, e-mail, and virtual libraries; having the ability to combine different possibilities for different schools and universities in productive ways, and overcoming the problem of lasting change in the content of educational materials. Oliver, et al. (2005) provided three key elements as guidance for teachers and educators on how to design and develop blended learning. These elements are: learning tasks, learning resources, and learning support.

Blended learning is not popular in some developing countries most especially in Africa, particularly Nigeria, contrarily, there is growth in its adoption of it in Asia (Eddy et al. 2014; Lim and Wang 2016), Europe (Hughes 2007), North America (Allen et al. 2007), Oceania (Taylor and Newton 2013), and even in many developing and emerging regions (Alebaikan and Troudi 2010; Bati et al. 2014). Hence, there is a need to adopt it for effective teaching and learning for distance learning and unforeseen circumstance like Covid19 epidemics. Therefore, the problem addressed in this study stems from the need to provide the learning support needed in the blended learning environment.

1.1 Aim

This study aims to examine how internet radio can be used within a blended learning model to provide students with a total learning concept.

1.2 Specific objectives:

Identify the various benefits of Blended Learning
Highlight the technical aspects of the Internet Radio – Blended Learning model.
Highlight possible benefits of Internet Radio – Blended Learning model.

1.3 Problem Statement

The teaching and learning environment is embracing several innovations through the use of Information Technology. The introduction of blended learning (a combination of face-to-face and online teaching and learning) initiatives is one of these innovations. Though in theory, the concept of blended learning might be straightforward; however, in practice, it is complicated to implement (Wang et al. 2015). And its uptake, especially in the developing world faces challenges for it to be an effective innovation in teaching and learning. Blended learning effectiveness has quite several of underlying factors that pose challenges. One big challenge is about how users can successfully use the technology and ensuring participants' commitment given the individual learner characteristics and encounters with technology (Smyth, et. al. (2012)). The Internet Radio offers a well-proven concept to ameliorate and enhanced learning and teaching processes going forward (Coccoli, (2014)). Hence, this paper examines how internet radio can be used within a blended learning model to provide students with a total learning model.

2. METHODOLOGY

This study was guided by aspects of the "Preferred Reporting Items for Systematic Reviews and Meta-Analyses" (PRISMA) guidelines (Tranfield and Smart, 2003; Moher et al., 2009). Secondary data were collected through a review of relevant materials including articles, theses, conference presentations, and other documents available on the internet. The documents were identified through a combination of searches, using keywords and terms associated with the study. Such as e-learning, blended learning, traditional learning, and internet radio. No date restrictions were imposed on the search as priority was given to the relevance of the materials in terms of their substantial contribution to the ongoing discourse on blended learning and internet radio, irrespective of the age of the material.

The full texts were read thoroughly to extract the relevant information. Pieces of information gathered were analyzed, combining the qualitative content analysis (Elo and Kyngäs, 2008) and recursive abstraction techniques (Leshan, 2012). That is, the contents were summarized under themes without coding but with notes. In this regard, the relevant information was summarized repeatedly, guided by the keywords and phrases already identified. The result was a more concise and refined summary of the relevant literature regarding the key issues as presented in the Result and Discussion section.

3. RESULT AND DISCUSSION

3.1 Blended Learning

According to researchers, the following blended learning benefits will be derived by students and institutions:

i. It will facilitate improved learning outcomes, access flexibility, a sense of community, the effective use of resources, and student satisfaction (López-Pérez et al., 2011).
ii. The increased flexibility of access to learning will reinforce the student's autonomy, reflection, and powers of research (Smyth, Houghton, Cooney, and Casey, 2012).
iii. It will encourage the development of critical thinking skills and promotes student satisfaction (Owston et al., 2008), and enables students to become more motivated and more involved in the learning process, thereby enhancing their commitment and perseverance (Donnelly, 2010).
iv. Cost and resource effectiveness is also considered an advantage of blended learning (Vaughan, 2007). Costs for institutions are saved as developed materials can be placed online and re-used for an extended period. Furthermore, the staff and student classroom contact time can be reduced and consequently save on staffing costs.

3.2 Internet Radio – Blended Learning: Technical Aspects

Prominent among the available mass media (Internet included) is radio. It was the first according to Coccoli, (2014) mobile device to be employed. Radio is all about the audio signal. Radio has gone through an evolutionary process for many years and there has been some application of broadcast radio in distance learning years back. Broadcast radio, also known as Interactive Instructional Radio (IRI), after print, is perhaps one of the oldest technologies used to support distance learning. As reflected in the following excerpt from a World Bank / USAID report (1999), to achieve interactivity, the radio delivery component is most often integrated with a more traditional classroom-based model: …the distant teacher carries the main weight of the teaching and directs learning activities (such as exercises, answers to questions, songs and practical tasks) that take place during carefully timed pauses in the audio script.

The classroom teacher's role is to facilitate the lesson, give individual assistance to learners and provide follow-up support after the audio component is finished. In some programs, such as those for language instruction, the classroom teacher's role is expanded to include periods of teaching. IRI can be transmitted via several means including the use of traditional commercial and public broadcasting infrastructure, low cost, portable FM transmitting stations, and, most recently, specialized digital satellite radio networks. A clear advantage of IRI as an educational medium for developing countries is its potential to reach very large numbers of participants due to the widespread availability of inexpensive, radio receivers.

3.3 Bringing Radio to the Internet (Internet Radio)

Coccoli (2014) reported that following the development and the evolution of the Internet and the World Wide Web (WWW), the radio has turned into Internet radio (web radio, net radio, streaming radio, e-radio, IP radio, online radio) and the users can listen to programs through a browser on a PC, over an Internet connection. Wikipedia and Techopedia (2021), Internet radio is a digital radio service that uses the Internet as a distribution medium of broadcasting instead of the traditional radio waves. And it is usually referred to as webcasting since it uses the Internet as the broadcasting medium. Broadcasting is the mode of spreading information widely by sound and or vision to a group of people remotely (Ogunmilade, 1988).

From a very technical point of view, Internet radio is just a radio station, which broadcasts over the Internet rather than over the air. Voice and music are digital audio signals (Priestman, 2002) and content is delivered through a dedicated streaming server. As a consequence, users can listen to programs through any device provided with connection and playback capabilities (for example, a Web browser on a standard PC, a mobile device with IEEE 802.11 connectivity), not an FM receiver. Listed below are the minimum equipment required to set up an educational internet radio system Radio Hosting Providers: These are the organizations that are globally licensed to host internet radio broadcasting services.

i. Studio Based Radio Server: This will serve as a pre-storage for audio files and also use to prepare audio for recorded programses.
ii. Mobile Station Server: This is for outside broadcasting activities whenever the need arises. This is a combination of hardware and software with large storage space that can be moved from one place to another.
iii. Broadcasting Software: A program installed on Studio Based Radio Server. Its main function is to format voice/music into an appropriate live feed that will be broadcast to listeners, regardless of the device they use to listen. Typical examples are Mixxx, BUTT, and Mediacast.
iv. Microphone: A device that translates sound vibrations in the air into electronic signals or scribes them to a recording medium.
v. Boom arm Plus Shock Mount: A shock mount effectively holds a microphone in place while isolating it from the stand or boom it is attached to.
vi. Pop Filter: A pop filter, pop shield or pop screen is a noise protection filter for microphones, typically used in a recording studio
vii. Headsets: A headset is a hardware device that connects to a telephone or computer, allowing the user to talk and listen while keeping their hands free.
viii. Mixer Console: A sound mixer can also be known as a mixing console or more commonly as an audio mixer. This is an electronic device used for mixing, balancing, and combining different sounds and audio signals, sources like microphones, instruments, synthesizers, or previously recorded audio.

ix. Mixer USB Interface: A USB MIXER is a box (similar to that of an audio interface) that has one or more USB ports that allow you to play and record audio directly into your computer.
x. Headphone Amplifier: A headphone amplifier is a device that allows multiple headsets to be connected to one or more audio sources (typically balanced audio sources) at the same time to monitor sounds during a recording session, either singing or playing from the "live room" or recorded tracks.
xi. Foam Soundproofing Panels: The purpose of sound blocking foam is to prevent noise from traveling through walls.

3.4 Modes of Operations of Internet Radio

There are two main modes of operations of Internet radio: Automatic/Recorded Mode and Live Mode. In the automatic/recorded mode, the lecturer will use content creator to prepare an edited audio lecture that will be uploaded for automatic broadcasting In the automatic/recorded mode, the lecturer will us the e-content creator to prepare an edited audio lecture that will be uploaded for automatic broadcasting. The Live mode is always online in real-time and can also be used for interaction with the help of social media platforms and telephony discussion. This mode encourages all stakeholders to assume they are all in a global village for participation.

3.5 Benefits of Internet Radio as an Educational Broadcasting Tool

Some of the benefits of Internet-radio as an educational broadcasting tool are as stated below:

i. Radio broadcasting makes it possible to listen to the lectures, talks, discussions, and seminar proceedings of educational interest in which renowned authors, educationalists, leading scholars, and other important personalities may participate. Such contact provides immense educational and psychological value to the students;
ii. Through its planned and sequenced classroom lessons on various topics related to school subjects, radio broadcasting may provide much assistance to the classroom teacher in realizing the instructional objectives;
iii. Radio broadcasting is a potent source of education as it is capable of integrating education with the real-life experience on one hand and healthy entertainment and source of pleasure on the other. The students can be easily motivated to listen to the radio talks and thus derive the desired educational benefits;
iv. As a mass media, radio broadcasting is a highly economical source of educational instructions. Its advantage may reach uniformly millions of its listeners by breaking distance and time barriers and the cost implication is much as compared to its associated benefits;
v. Radio broadcasting has the capacity of solving various problems in the field of education arising out of the shortage of man-material resources. Such as a shortage of good textbooks, well-planned instructional programs, suitable instructional devices and aids, and competent teachers; the learner population is increasing day by day; courses of instruction are widening. It is not possible to provide the benefits of education to such a large number of learners with the desired efficiency without the aid of an effective medium like radio broadcasting.

3.6 Benefits of Internet Radio – Blended Learning Model

Some of the benefits of the Internet Radio–Blended Learning model are:

i. The possibility of integrating educational broadcasting with a variety of Web applications and services, including the sharing and storing of content (even based on cloud computing) enables a variety of educational activities. To enhance the users' experience while they are online, all the Web 2.0 communication tools are exploited and integrated into the lesson plan, which must take into account and encourage the possibility of multiple interactions.

ii. The adoption of the internet radio as an educational broadcasting tool in a blended learning environment enables the use of audio and video content as well as live and streaming lessons for remote learners, which can access the same lesson in podcast formats. From an educational point of view, the radio program can be simply regarded as a remote lesson. The blended learning lesson can be improved by the interaction with listeners who can participate through various functions, setting up a real media-convergence model (Jenkins, 2004).

iii. Furthermore, according to this paradigm, the learning activity is no longer teacher-based but rather student-based. Students which are the main actors, can now actively participate in the learning process, communicate with each other, and interact with teachers, with whom they exchange information as well as experiences. In practice, the Internet itself has to be considered as a learning platform, in which educational content is available and accessible, easy to find, and whose selection is driven by the users' interaction, according to a collaborative knowledge construction model, and outside traditional e-learning platforms (Adorni, Battigelli, and Coccoli, 2007).

iv. Educational activity performed through internet radio is meant to take advantage of the concurrent presence of remote learners and teachers during the live lectures. At the same time, podcasting can be used to virtually attend a pre-recorded lesson as well as for a better understanding (Moura and Carvalho, 2008) since learners can listen to podcasts, after downloading them, on portable devices (e.g., MP3 players), while moving even without the mandatory requirement of a continuous internet connection. Podcasts are widely used in educational activities (Evans, 2008) and research has provided relevant results on them (Morisse et al., 2009; Lonn and Teasley, 2009).

v. Empowering podcasts with social media results in a winning strategy because they support and encourage collaboration among users (Lee et al., 2006). At the same time, they enable the construction of adaptive programming schedules (Baccigalupo and Plaza, 2007) tailored to the individual needs, according to their specific attitudes and learning styles. The podcasting is a suited educational tool in blended learning strategies (Umi Hanim, Mazlan, and Halimatolhanin, 2009).

4. CONCLUSION

This paper examines the use of Internet radio in a blended learning model to enhance students' learning experiences. The study identified the numerous benefits of blended learning. The technical aspects of the Internet Radio–Blended Learning model was also x-rayed. It further recognized internet radio as an educational broadcasting tool and internet radio – blended learning model as a veritable technology capable of enhancing students' learning experiences.

5. RECOMMENDATION

Based on this study, the use of the internet radio-blended learning model is recommended as a teaching and learning method for Higher Education Institutions in Nigeria to complement their learning programmes.

In addition, the following are recommended for institutions that intend to implement this paradigm:

i. they must be realistic about the investment of time, effort, and resources that are required for development and implementation;
ii. Institutions must create the necessary policy, planning, resources, scheduling, and support systems to ensure that internet radio-blended learning initiatives are successful;
iii. The resources required are not restricted solely to the acquisition of equipment and technology, but also refer to the human resources used in developing and managing the implementation of blended learning.

REFERENCES

1. Adorni, G., Battigelli, S. and Coccoli, M. (2007). Beyond learning management systems in lifelonglearning. Proc. of 13th Int. Conf. on Distributed Multimedia Systems, International Workshop on Distance Education Technologies, DMS-DET 2007, pp. 159-164.
2. Alebaikan, R., & Troudi, S. (2010). Blended learning in Saudi universities: Challenges and perspectives. ALT-J Research in Learning Technology, 18(1), 49–59. HTTPS ://doi.org/10.1080/09687 76100 36576 14.
3. Allen, I. E., Seaman, J., & Garrett, R. (2007). Blending in: The extent and promise of blended learning education in the United States. Needham, MA: Sloan-C.
4. Baccigalupo, C. and Plaza, E. (2007), Sharing and combining listening experience: a social approach to web radio. Proc. of the 2007 Int. Computer Music Conf., pp. 228–231.
5. Barbour, M., Hasler Waters, L, and Hunt, J. (Ed.). (2011). Online and Blended Learning: A Survey of Policy and Practice in K-12 Schools Around the World. International Association for K-12 Online Learning. Vienna, VA.
6. Bati, T. B., Gelderblom, H., & Van Biljon, J. (2014). A blended learning approach for teaching computer programming: Design for large classes in Sub- Saharan Africa. Computer Science Education, 24(1), 71–99. https://doi.org/10.1080/08993 408.2014.89785 0.
7. Browning, M. and Rigolon, A. (2019). School green space and its impact on academic performance: A systematic literature review. International Journal of Environmental Research and Public Health, 16(3), 429. doi:10.3390/ijerph16030429
8. Coccoli, M. (2014). The use of Web-radio in mobile learning. Journal of e-Learning and Knowledge Society, 10(3): 147-157
9. Donnelly, R. (2010). Harmonizing technology with interaction in blended problem-based learning. Computers & Education, 54(2), 350-359. doi:10.1016/j.compedu.2009.08.012
10. Eddy, L. J., Nor-Aziah, A., & Jasmine, J. (2014). Blended learning: Examining concepts and practices. In E. Mohamed-Amin (Ed.), Blended & flipped learning: Case studies in Malaysian HEIs. Bangi: Pusat Pengajaran & Teknologi Pembelajaran, Universiti Kebangsaan Malaysia.
11. Elo, S. and Kyngäs, H. (2008). The qualitative content analysis process. Journal of Advanced Nursing, 62(1), 107–115. doi:10.1111/j.1365-2648.2007.04569.x
12. Hughes, G. (2007). Using blended learning to increase learner support and improve retention. Teaching in Higher Education, 12(3), 349–363. https:// doi.org/10.1080/13562 51070 12786 90.
13. Jenkins, H. (2004), The cultural logic of media convergence. International Journal of Cultural Studies, Vol. 7, No. 1, pp. 33-43.
14. Khan, B. (2005). E-learning strategies (Translation: Ali Sharaf Musawi, Salem bin Jaber al-Waeli, and Mona Alteja), Aleppo, Syria.
15. Lee, M. J. W., Chan, A., McLoughlin, C. (2006), Students as producers: second-year students' experiences as podcasters of content for first-year undergraduates. Proc. Of the 7th Int. Conf. on Information Technology Based Higher Education and Training, pp. 832-841.
16. Leshan, D. (2012). Strategic communication. A six-step guide to using recursive abstraction applied to the qualitative analysis of interview data. London: Pangpang.

17. Lim, C. P., Wang, T. & Graham, C. (2019). Driving, sustaining and scaling up blended learning
18. practices in higher education institutions: a proposed framework. Innovation and Education. 1.1., (pp. 1–38). https://doi.org/10.1186/s42862-019-0002-0
19. Lim, C. P., & Wang, T. (2016). A framework and self-assessment tool for building the capacity of
20. higher education institutions for blended learning. In C. P. Lim & L. Wang (Eds.), Blended learning for quality higher education: Selected case studies on implementation from Asia-Pacific (pp. 1–38). Paris: UNESCO.
21. Lonn, S., Teasley, S. D. (2009), Podcasting in higher education: What are the implications for teaching and learning? Internet and Higher Education, Vol. 12, pp. 88–92.
22. López-Pérez, M. V., Pérez-López, M. C. & Rodríguez-Ariza, L. (2011). Blended learning in higher education: Students' perceptions and their relation to outcomes. Computers & Education, 56(3), 818-826. doi:10.1016/j.compedu.2010.10.023.
23. Morisse, K., Ramm, M., Schuler, T., Wichelhaus, S. (2009), A mobile blended learning approach based on podcasts concerning the students' media literacy. Proc. Of the Int. Conf. on Mobile, Hybrid, and On-line Learning, pp. 41-46.
24. Moura, A., Carvalho, A. A. (2008), Mobile learning: teaching and learning with mobile phones and podcasts. Proc. of the 8th IEEE Int. Conf. on Advanced LearningTechnologies, pp. 631- 633
25. Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., Altman, D., Antes, G., & Tugwell, P. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. PLoS Medicine, 6, 7. doi:10.1371/journal.pmed.1000097
26. Ogunmilade, C. A. (1980) Educational broadcasting. In C. A Ogunmilade et al., (Eds) Fundamentals of Educational Technology Ibadan: YiBooks
27. Oliver, R., Herrington, J., and Reeves, T. (2005). Creating authentic learning environments through blended learning approaches. In C. Bonk & C. Graham (Eds.). Handbook of Blended Learning: Global Perspectives, Local Designs. New York: Jossey Bass.
28. Owston, R., Wideman, H., Murphy, J., & Lupshenyuk, D. (2008). Blended teacher professional development: A synthesis of three program evaluations. The Internet and Higher Education, 11(3-4), 201-210. doi:10.1016/j.iheduc.2008.07.003
29. Smyth, S., Houghton, C., Cooney, A., & Casey, D. (2012). Students' experiences of blended learning across a range of postgraduate programs. Nurse Education Today, 32(4), 464- 468. doi:10.1016/j.nedt.2011.05.014
30. Taylor, J. A., & Newton, D. (2013). Beyond blended learning: A case study of institutional change at an Australian regional university. The Internet and Higher Education, 18(3), 54–60. https /doi.org/10.1016/j.ihedu c.2012.10.003.
31. Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a methodology for developing evidence informed management knowledge by using thematic review. British Journal of Management, 14, 207–222.
32. Umi Hanim, M. I., Mazlan, Z., Halimatolhanin, M. K. (2009), iRadio OUM – The developmentof educational internet radio to enhance open and distance learning. Proc. of ICI9 – Int. Conf. on Information.
33. Vaughan, N. D. (2007). Perspectives on blended learning in higher education. International Journal on E-Learning, 6(1), 81-94. Retrieved from EdITLib Digital Library. (6310).

34. Wang, Y., Han, X., & Yang, J. (2015). Revisiting the blended learning literature: Using a Complex Adaptive Systems Framework. Educational Technology & Society, 18(2), 380–393.
35. Wolf, J., Prüss-Ustün, A., Cumming, O., Bartram, J., Bonjour, S., … Higgins, J. P. T. (2014).Systematic Review Assessing the impact of drinking water and sanitation on diarrhoeal disease in low- and middle-income settings: systematic review and meta-regression. Tropical Medicine and Health, 19 (8), 928–942. doi:10.1111/tmi.12331.