

# ***Promoting a Student Interactive Learning Environment using Smart Class Rooms: An Enhanced Approach for Namibian Universities***

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## **Abstract**

Over the past years, there has been a tremendous increase in the use of Information and Communication Technology (ICT) in all the aspects of life from education, business and government operations. A vast number of confirmed studies have been carried out and publicized to implement ICT services and infuse new technological approaches such as E-learning for an effective education delivery at high institutions across the world and the effects have been amazingly awesome. However, to date, very less has been done to improve and transform the teaching and learning process using ICT in the classroom especially in developing countries. To this point, Most Namibian universities still use the traditional stand-and-deliver lecture style. This dominating teaching method is associated with lots of confinements particularly when it comes to dealing with huge numbers of students in big lecture halls and class rooms. Some of the short comings associated to this teaching approach include poor audibility of lectures, deprived visibility and destitute student engagement.

**For this reason, there is an acute need to withdraw from this teaching approach to a more flexible and an interactive way that stimulates profound teaching and learning by allowing the student to be a part of a classroom of students. Such an environment creates a great opportunity for students to learn from each other and not entirely on the teacher alone.**

### **Author Keywords**

Smart Classrooms, Interactive Learning, ICT

### **Introduction and Background**

Over the past decades, the use Information and Communication Technologies have recently gained groundswell of interest in High institutions [1]. In a class room, the students' performance is commonly influenced by a lot of factors and Research shows that in most cases, the physical setting of the class room can have an evident impact on student learning [2]. The availability of resources which includes the accessibility to class materials plays a significant role in determining how conducive the classroom is. Studies on the introduction of using ICT to deliver lectures in high learning institutions have rapidly increased over the past decades [3] and the use of ICT have greatly changed the face of Education [2]. Their nature has highly changed the face of education over the last few decades. However, there is still more that need to be done.

With the advancement of technology, the concept of Smart Classrooms using technologies such as whiteboards was also introduced [4]. This are classrooms where teaching and learning is heightened by combining different components such networking devices, advanced softwares and

audience response technologies. With the model of Smart classrooms, both the teacher and the students are involved in the teaching process [5]. Carl Wieman in one of his paper wrote: "It's what's going on in the students' brains that matters. It's not who is teaching your huge class that matters but how they teach it" [6]. Nonetheless, this is not what is being done. In most cases, learning is entirely based on what the lecture up in the front is doing. As a result, student's learning is stifled and deprived.

Research shows that with the use of interaction strategies in the class rooms, students learning at different rates and abilities can highly benefit from each other. It is also believed that a weak student can improve his learning by up to 73% when interacting with a classroom of students [6].

This paper is therefore aimed at presenting a proposed design of a novel system which allows for maximum student engagement and active participation during class period especially in large class rooms. This innovation allows students to post questions from their mobile devices during the class and get constant responses from both the lecture and fellow students in real time. The questions and feedbacks are then displayed on a projector mounted on the wall which is visible to all and are conveyed to all the nodes in the network. In the same manner, the lecture can also distribute class notes to student's devices. The same system can further be used for taking class rooms quizzes and tests. Assignments can be handed out to students in the same way and class attendance can also be collected thereby saving time and resources.

## **Related Work**

A number of Student Interactive Systems have been initiated. In [6] a student-classroom interaction tutorial-like system using learning automata was developed. With this system, each member of the classroom is endorsed to learn not only to learn from the teacher(s) but also to grasp knowledge from any of his fellows.

Further, in [7], a virtual interactive classroom which uses the RTMP (Real Time Messaging Protocol) was developed. This system allows teachers and students to issue streaming audio, video and other data messages to present streaming media with interaction or navigation as though as though they were studying in an actual classroom . Although this is a great system, it is still unable to solve the current dilemma as it was aimed to be an E-learning where students in various locations can interact.

Most of these systems are only being used in developed countries and therefore there is an serious need for them to be implemented in developed countries. Our work therefore attempts to address this matter

## **Problem Statement**

With the increase of university intakes every year, lectures and tutors are usually faced with a lot of challenges when it comes to dealing with huge numbers of students. This situation is worsened by the fact that most if not all Universities in Namibia still uses the stand-and-deliver traditional lecture method which is associated with a lot of inconsistencies such as poor audibility of lectures and deprived visibility to students most particularly in outsized class rooms. Although this method is common and has been in use for decades, it is deemed to be very inconvenient in institution of high

learning and can be deleterious to students thus contributing to poor performance in the class rooms.

## **Research Goals**

### Main Goal

The main objective of this study is to develop a system that stimulates profound teaching and learning by fostering a more interactive and an immersive classroom environment where students are free to contribute in real time, ask questions, debate on ideas and get constant response from the lectures and from each other. With the new design, we will overcome many of the shortcomings and inadequacies such as poor audibility of lectures, deprived visibility and shyness to ask questions which are associated with teaching in big class rooms and lecture halls.

To achieve this objective, we are going to answer the following **Research Questions**:

1. How can we design a learning environment that overcomes poor audibility of lectures and deprived visibility?
2. How can we implement a learning environment that improves interaction between lectures and students for example by allowing shy students to ask or give feedback in crowded rooms?

### **Method:**

The proposed system will be designed as an android app which can be installed on the student's mobile phones and computers. The app will be integrated with the Real Time Messaging Protocol (RTMP) which allows for high speed transmission of audio, video and data

between flash player and the server[]]. However, for this project, we are only focusing on the transmission of data between the nodes and not audio or videos.

## Research Status

At the moment, we are still at the initial phase of this project and we are thus working hard to clearly outline and understand the system requirements and user specifications. We are hoping to finish this before the end of March. We will then begin with the coding of our first prototype which is likely to take 2-3 months. This work is not intended for an academic qualification, it is general research.

## References

1. elmaifi. (2014, February 09)<http://edtechreview.in/trends-insights/insights/959-advantages-of-using-ict-in-learning-teaching-rocesses>). EdTechReview. Retrieved from Advantages of Using ICT in Learning-Teaching Processes.
2. Hannah, Ryan, "The Effect of Classroom Environment on Student Learning" (2013).Honors Theses.Paper 2375.
- 3 . Pulkkinen, J. (2007). Cultural globalization and integration of ICT in education. In K. Kumpulainen (Ed.), Educational technology: Opportunities and challenges (pp. 13–23). Oulu, Finland: University of Oulu.
4. Guillermo Bautista, F. B. (2013). Smart Classrooms: Innovation in formal. Bulletin of the IEE Technical Committee on Learning Technology, Volume 15, ,Number 3, pp. 18-21.
5. Bradshaw, J. (2011, May 12). University students fare better with interactive learning, study finds. Retrieved from The Globe and Mail: <http://www.theglobeandmail.com/news/national/university-students-fare-better-with-interactive-learning-study-finds/article579698/>
6. B. John Oommen, M. K. (2010 Feb, February). Modeling a student-classroom interaction in a tutorial-like system using learning automata. doi:doi: 10.1109/TSMCB.2009.2032414.
- 7 W. Premchaiswadi, A. Tungkasthan and N. Jong-sawat, "Enhancing learning systems by using virtual interactive classrooms and web-based collaborative work," IEEE EDUCON 2010 Conference, Madrid, 2010, pp. 1531-1537. doi: 10.1109/EDUCON.2010.5492344