Using Multimedia System as an Instructional Strategy: Implication and Challenges

NwigboStella N.
Research Scholar,
Department of computer sciences
Jain university, Bangalore.
Nwigbo4surestella@gmail.com

Dr. MadhuB.K
HOD, Information sciences Engineering,
R.R, Institute of Technology,
Hesaraghatta Main road, Banglore.

Abstract: Teaching as a practice, presents some challenges. One of these challenges is lack of understanding by the students. Traditional means of teaching has not overcome this hence, the introduction of multimedia system. This paper introduces the use of multimedia system in teaching. It defines the concept, examines some literature on it, and presents how to build it and some of its benefits and challenges. It further presents some recommendations for the effective use of multimedia systems for the development of education.

Keywords: *Multimedia, Teaching, Multimedia Systems, Education.*
_____*****_____

I. INTRODUCTION

Multimedia involves the use of more than one medium in the expression, communication and transmission of knowledge to learners. Multimedia systems facilitate the communication of concepts to students in teaching. In teaching, multimedia systems are used in expressing concepts in forms of texts, graphics, audios, animations and videos. Traditionally, learning has always been done through textbooks which usually were well organized, thorough and covering large number of topics. These texts were static and could not provide the students with the newest information. Developments in technology in the 21st century brought about dynamic systems that incorporatedifferent media of transmission of information to students.

Over the years, studies have been done in the development of multimedia systems to enhance teaching in schools. Different systems have been designed to meet different needs as well as studies to improve on existing systems.

Pryor and Bitter (2008) investigated the use of multimedia to teach in-service teachers and they noted the following;

- Teachers were helped in learning by the video modelling in the module.
- Strategies for discussion were learned, applied and retained by teachers.

Khan (2010,a) investigated into the effect of using multimedia in teaching children with varying educational needs. In his investigation, children with autism and Down's syndrome were taught with same multimedia content without any e-learning facility. It was observed that both groups enjoyed the classes but while the children with

autism could convert it into learning, the children with Down's syndrome could not. It was observed that the latter group's enjoyment was limited to having fun and did not translate into learning. In his work he recommended that each group be offered different teaching strategies as their need vary due to their different conditions. This implies that the use of multimedia in teaching children is dependent on the need or problem. Different problems require different multimedia content designs.

Ahmad et al (2010), in their investigation into the result of incorporating multimedia in the teaching of mathematics, observed that students who were taught mathematics with the use of multimedia scored higher than those who were taught using only the traditional textbooks and board method. In the teaching of mathematics, the use of multimedia revealed lots of techniques in the solving mathematical problems. Plots were properly shown to the students with minimal errors in their presentations.

Khan (2010, b) in his investigation into different architectures for an expert system enhanced multimedia teaching, observed that different configurations have their different benefits in learning. He however noted that result obtained from the investigation showed that no single configuration best soothes all needs. This shows that different multimedia configurations or designs are targeted towards different learning needs of learners as stated earlier. Therefore, it is important to know what the needs (problems) of learners are and to design systems that best meet the need.

Razak (2010) in his analysis of shared knowledge by instructional multimedia experts outlined some principles

considered for the design of multimedia modules. These principles include;

- Basic Principles: This includes the learning theory, instructional design theory which considered ARCS (Attention, Relevance, Confidence and Satisfaction) factors and the instructional design process.
- Design Principles: The principles under this category include content design, screen design, interactivity and audio and video design.
- Authoring Principles: This category consists of authoring tools and software support tools.

Wang et al (2010) developed an adaptive multimedia content description mechanism which demonstrated its application in web-based learning. This innovation was done due to the varying backgrounds and demands of online learners. It was named ADAM and its core feature was the ability to adapt presentations to individual learner's need.

Tien and Osman (2010) in their conference paper proposed the use of pedagogical agents in interactive multimedia teaching. In their paper, they opined that the agents should be experts, knowledgeable in the various areas which they are to be used. Their key function is to serve as companions and motivate the students in their learning. Also, in the designing of these agents, the goals of the lessons should be considered in order to obtain agents with requisite skills needed for the teachings. In delivering thefunctions, they also noted that the pedagogical agents should verbally interact with the students rather than use on-screen communication as this provides an emotional connection between the students and the pedagogical agents. Most importantly, they noted that designers should understand the background of the users. They proposed the use of proactive agents for novice learners and responsive agents for advanced users. This is aimed towards achieving satisfaction from the users.

How to Design Multimedia Systems for Teaching

Huang (2005), in his work, proposed five phases in the process of designing multimedia learning modules;

- Phase 1: Understand – There is need to understand the problem and needs. In understanding the problem, you know the challenges of the students. This forms the basis of the rationale for the design of the lesson modules. Thereafter, you set up learning goal by identifying what you want your students to learn. Then, you integrate it with the needs of the students. To design an effective module, you must marry your learning goal with the students' needs.

- Phase 2: Design – You design the content of the module. In designing the content, you first, choose a concept in which the students are often confused about. Secondly, you decide the best method to present the concept. This involves evaluation of different methods and choosing one which addresses the need of the students. This decision making process is very vital for the design. Thirdly, you develop activities that will engage and motivate the students. In this, you find out what will be the students' interest in the topic, how best to present it to them and the best real life examples to use in the illustration of the concept. Lastly, you develop assessment to evaluate student understanding of concept. This assessment usually checks between output and set goals for learning.
- Phase 3: Build – You build multimedia assets and interactivity. In this you develop multimedia components that storyboard the concept and or simulate the concept. This sometimes may require special skills to build effective multimedia components.
- Phase 4: Test – You test and evaluate your module on your target users or learners. In this phase you check for the satisfaction of your learners from the use of your module.
- Phase 5: Improve – Depending on the result of your evaluation, you improve on your module. This involves interactive redesign where you redesign your module based on the recommendations of the users. This often, is a continuous process as modules usually require changes and updates.

Benefits of Using Multimedia Systems in Teaching

There are various benefits of the use of multimedia systems in teaching. In this paper, I shall categorize these benefits into three; benefits to students, benefits to teachers and benefits to the society.

Benefits of using multimedia systems to students

There are many benefits of multimedia systems to students. The following are few of the many benefits;

- Multimedia systems bring dynamic systems to life in learning unlike the power point and traditional textbooks. This is achieved through incorporation of animated designs and videos.
- The use of multimedia facilitates learning. Schmid (2008) noted that the use of interactive whiteboard made the student to understand the lessons better. When students access same information in different formats, it enhanced understanding.
- Multimedia systems allow students to learn in various styles.

- Multimedia systems enable access to various learning materials. System such as the interactive whiteboard provides seamless access to various learning resources like videos, audios, pictures etc.

Benefits of using multimedia systems to teachers

Multimedia systems have added a new life to teaching. Teachers who have used these systems have seen some benefits. Some of these benefits are outlined below.

- Multimedia systems can be used to train students from different learning background with common core module.
- They incorporate interactivity which intrigues and challenges the students and making the students to be engaged in the in the learning processes. Schmid (2008), in his study which analysed the integration of multimedia in English language classroom which has interactive whiteboard, discovered that the students were motivated and engaged in the learning due to the varying ways in which the same information were passed to them.
- Multimedia systems reduce teachers' efforts in teaching. The systems help the students to understand concepts easily thereby, reducing the teachers' efforts.
- The use of multimedia systems requires teachers to train. These training enhance the skills and knowledge of teachers.
- Multimedia systems enable teachers to teach students with various abilities.

Benefits of using multimedia systems to the society

From the concept, usage and advantages of using multimedia system discussed thus far, it can be seen that this has a direct impact on the society. Some of these benefits are as follows;

- Economic: The use of multimedia systems in teaching requires the purchase of some of these systems. The supply chain in the acquisition of these systems offers an economic benefit to the society. Also the use of these systems may lead to hiring of those skilful in areas that may be needed for design of some contents. For example, if a teacher needs some graphic designs in his/her contents and does not have graphic designing skill; he/she will need to hire someone with the skill. Same applies to other art contents of designing multimedia modules.
- Development of Knowledge: It has been seen from the introduction that the use of multimedia systems in teaching helps in easy understanding by learners. This therefore, means advancement of knowledge for the development of the society.

Challenges of Using Multimedia Systems in Teaching

Like every other systems, the use of multimedia systems in teaching has its challenges. In this paper, I have outlined some of these challenges.

- Often the use of multimedia in learning provides plethora of information which sometimes overwhelm the students. In the use of multimedia, sometimes the teachers make available so much that the students feel threaten due to limited time to assimilate from the information provided.
- Attitude: Schmid (2008) observed that some students felt the use of multimedia in the teaching of English Language encourages laziness amongst students. Some felt that when the teacher provides a lot of information that make the students understand without stress encouraged them to be lazy with studies.
- Multimedia content are limited to specific group of people. A particular multimedia content cannot be used to teach people with varying needs. This was noted in the introduction from the work of Khan (2010,a) where an investigation into the effects of the use of multimedia in teaching children of different needs was investigated and observations were made to that effect. Irrespective of the important benefits of the use of multimedia, its use demands a professional understanding for a good design of its contents. The teacher must know what the needs of the students are and develop a good strategy on how best to meet those needs.
- Designing multimedia contents, often time, requires technical skills. Graphic designs, audio and video making all require skills for them to be properly made. Therefore, availability of skills is one of the challenges to the use of multimedia in teaching. Many countries have limited skills available in this area hence, the predominant absence of the use of multimedia in teaching.
- The use of multimedia system requires financing. Funding has become a major challenge to the use of multimedia system in Nigeria.

II. CONCLUSION

This paper presented the concept of multimedia system usage in teaching; some literature, its benefits and the challenges. Whereas, the other sections of the paper presented the benefits and challenges, this section highlights some recommendations that aim at utilizing the concept of multimedia teaching for the development of the education. Therefore, having seen how important the use of multimedia is to the students, it is necessary for students to develop the attitude of accepting it. Students need to welcome the concept for easy understanding of lessons presented by teachers. Contents of multimedia should be explored by

students for optimal understanding of courses. Since it has been seen from the paper that multimedia contents present concept in elaborate forms, in order not feel very satisfied with these contents, students are also advised to further, go deep in their search for more knowledge on multimedia contents. This is due to the fact that the contents of multimedia modules are limited by their designers.

Likewise, teachers should implement the use of multimedia systems in their teachings. As noted by Schmid (2008) in his work, two things should be checked while using multimedia in the teaching of students; balancing the amounts of representations used in lessons to avoid overwhelming the students and encouraging students to engage with multimedia materials for effective understanding. This therefore, shows the need for balancing. Despite the various benefits of multimedia resources, a teacher needs to create a balance. Necessary skills needed for building formidable and quality multimedia contents should be developed by teachers who use the systems. Most importantly, before developing multimedia contents, teachers should have a comprehensive knowledge of the needs of the students so as to build proper contents that will best meet these needs.

The society on the other hand, should fund the use of multimedia systems in our teachings. Institutions should see to the usage of multimedia systems in our various schools as this facilitates learning. There should be promotion on the usage of multimedia system in teaching. The importance of multimedia systems to the educational development of any society is enormous and as such cannot be downplayed by any developing society.

REFERENCES

[1] Ahmad, A., Yin, T. S., Fang, L. Y., Yen, Y. H and How, K. W. (2010).Incorporating multimedia as a tool into mathematics education: A case study on diploma students in multimedia university.Presented at: International Conference on mathematics education research 2010.*Procedia of Social and Behavioral Sciences*.Vol 8.Pp 594-599.

[2] Huang, C. (2005). Designing high-quality interactive multimedia learning modules.*Journal of Computerized Medical Imaging and Graphics*.Vol. 29.Pp 223-233.

[3] Khan, T. M. (2010). An investigation of alternative architectures of an expert system enhanced multimedia training tool. *Procedia of Social and Behavioral Sciences*.Vol. 2.Pp 4336-4340.

[4] Khan, T. M. (2010).The effect of multimedia learning of children with different special educational needs.*Procedia of Social and Behavioral Sciences*.Vol 2.Pp 4341-4345.

[5] Pryor, C. R. and Bitter, G. G. (2008).Using multimedia to teach in-service teachers: Impact on learning, application and retention.*Journal of Computers in Human Behaviours*.Vol. 24.Pp 2668-2681.

[6] Razak, R. A. (2010). Shared knowledge among instructional multimedia design experts.*Procedia of Social and Behavioral Sciences*.Vol. 9.Pp 353-357.

[7] Schmid, E. C (2008). Potential pedagogical benefits and drawbacks of multimedia use in the English Language classroom equipped with interactive whiteboard technology. *Journal of Computers and Education*.Vol. 51.Pp 1553-1568.

[8] Tien, L. T. and Osman, K. (2010). Pedagogical agents in interactive multimedia modules: Issues of variability. *Procedia of Social and Behavioral Sciences*.Vol 7(C). Pp. 605-612.

[9] Wang, C., Wang D. Z. and Lin, J. L. (2010). ADAM: An adaptive multimedia content description mechanism and its application in web-based learning. *Journal of Expert Systems with Application*.Vol .37(12).Pp 8639-8649