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Animation as an Aid for Higher Education Teaching in Kenya: The Case of Africa Nazarene University

Rose Oduho
Assistant Lecturer, Maseno University, Maseno, Kenya
Raphael Ogutu
Lecturer, Africa Nazarene University, Kenya

Abstract:
Higher education worldwide is increasingly becoming digitized through online pedagogical platforms. In Kenya, the desire to go digital is one of the key agendas of the current government. This vision is to be achieved through provision of free laptops for all new class one pupils in public primary schools and development of techno cities. This paper is a product of an action research that was conducted at African Nazarene University using questionnaires as instruments of data collection. Thirty students from two departments and eleven facilitators/ lecturers from seven departments were selected at Africa Nazarene University's main and town campuses and formed the study sample. The paper examines the potential use of animation medium in supporting teaching and learning in Kenya for higher education. This is based on the premise that Computer animation has great potential to provide visual communication aids since it is interactive and could be used to create anything imaginable. Grounding their discussion on selected tenets of Constructivism, the authors purpose to determine the perception of students and facilitators in regard to the use of animation in teaching and learning at Africa Nazarene University. They also go deeper and seek to determine the readiness of students and facilitators in regard to the use of animation in teaching and learning at the institution of higher learning. From the findings, this paper observes that there is little employment of animation and other multimedia aid for higher education at Africa Nazarene University. To address this incongruity, the researchers recommend that institutions of higher learning should make an effort towards ensuring that students and facilitators are provided with the necessary equipment to enhance use of animation. Once implemented, this new technology will help higher learning institutions reduce on use of paper and white board/ black board facilities and this will, in turn, lead to improved output. Furthermore, the use of animation as a teaching aid is environmental-friendly, interactive, and sustainable.

Keywords: Animation, higher education, pedagogy, aesthetics, integrated learning

1. Introduction
There are many definitions about the word animation. However, for the purposes of the discussions in this paper, the following two definitions are deemed appropriate. First, the paper adopts Tversky and Betrancourt's [1] conceptualization of animation as "any application which generates a series of frames, so that each frame appears as an alteration of the previous one and where the sequence of frames is determined by the designer or the user". Second, the paper appropriates the term animation and etymologically avers that *animate* comes from the Latin verb *animare,* meaning "to make alive or to fill with breath." We can take our most childlike dreams or the wackiest worlds we can imagine and bring them to life. In animation we can completely restructure reality[2]. These definitions clearly show that animation is an art of creating frames and giving life to that which did not have life initially. Animation creation therefore can be compared to divine powers of giving life to non-living things.

1.1. Purpose
This paper is exploratory and seeks to find out basic use of animated information and perception among university students and their facilitators. Teaching and learning in Kenyan universities is mainly done through traditional way, a method that is through use of either blackboard or whiteboard and with a chalk or a marker. This paper examines the potential use of animation in supporting teaching and learning in Kenya's higher education, with a special focus on Africa Nazarene University.

1.2. Objectives
The research had two objectives: i) to examine the perception of students and   facilitators in regard to the use of animation and other multimedia presentations in teaching and learning at Africa Nazarene University, and ii) to establish the readiness of students and facilitators in regard to the use of animation and other multimedia presentations in teaching and learning at Africa Nazarene University.

2. Animation and Higher Education

Animation is majorly used in children educational videos, whereby school rhymes and folktales are animated from print and oral tradition sources. It appears that it is easier to communicate with animations at this lower learning levels compared to higher levels, which has complex concepts and theories to learn. A number of research studies done in this area also suggest that there is no statistically significant difference between animation and static illustrations in promoting conceptual understanding [3, 4, 5]. Most concepts and tasks in higher education are complex, involving different component skills, cognitive processes, and many different facts, which animations may help students understand. Animations are especially suitable in explaining the processes and dynamic activities [6]. The law department of Africa Nazarene University had a similar idea that because of the nature of their specialization, the majority of their units are not about processes and therefore might not need animations. According to Ambrose et al. [7], "to help students learn, instructors need to break down these complex concepts or tasks into their component parts, provide students [with] opportunities to perform these skills or cognitive processes separately, and then allow them to practice the integrated tasks before assessing them. Animation is thus the best teaching and learning process through a collaborative process between teachers and students via computer instructions.

3. Theoretical Framework

This paper premises its discussions on the constructivism theory. According to Culatta [8], constructivism embraces a "top-down" rather than a "bottom-up" instructional methodology. This means that, rather than teach all of the details that lead to a main idea; students discover the main idea and then derive the details from it. This theory states that learning is an active process of creating meaning from different experiences. In other words, students will learn best by trying to make sense of something on their own with the teacher as a guide to help them along the way [9].Consequently, and with regard to this paper, it thus follows that since higher education is complex and students are not the same, facilitators therefore need to employ different approaches to different class situations. It is, however, worth noting that despite this multi-faceted approach, one should have a major guiding teaching theory that his or her units revolve around.

From the foregoing, it is evident that the way a teacher designs animation learning materials will determine the ability for students to grasp the kind of information they are supposed to get. Animation here becomes a communication tool for sharing knowledge between the teacher and the students. Consequently, poorly designed animation teaching aid will lead to misinterpretation of the intended message and as a result knowledge is lost. Students can discover knowledge and create meaning by actively interacting with the computer animated lessons and science related subjects could benefit more than social sciences [10].

4. Do Animations and Multimedia Presentations Facilitate Learning?

As observed by Satendra et al. [10], "animation based lectures provide a valuable way to communicate dynamic, complex sequences of physiological events more effectively than text or a static graphic [11]. Previous work has established that students understand a complex signal transduction pathway better after viewing a narrated animation compared with a graphic with an equivalent legend (Liao, 1999). Liao's meta-analysis suggests that, as a whole, student learning is greater when a multimedia learning tool is included during instruction relative to a control group without such tools [12].

The analysis by Satendra et al. [10] shows that science related subjects could benefit more from animation than social sciences. A study by Kehoe et al. [13], intimates that students use sophisticated combinations of instructional materials in learning scenarios. In particular, the presence of algorithm animations seems to make a challenging algorithm more accessible and less intimidating, thus leading to enhanced student interaction with the materials and thus facilitating learning.

Visual cues are useful in enhancing learning effect of the animation [14]. Recently, many researchers are also paying attention to the interaction effect of animation learning and learner's characteristics. These studies have shown that learner's differences traits such as spatial ability, pre-knowledge and learning style have an impact on the learning effect of animation instruction [15]. Different learners need different methods of facilitation and also different disciplines require different approaches to learning. Designers or animators play a key role through the way they use the leaner's perspectives to develop the right interface and design to address the needs of the user. That is the instructional cues between a system and a user, an interface is the form and function of connecting to the instructional system [16, 17, 18].

Aesthetics of animation plays a huge role when it comes to communication and motivation to use. Therefore it is not all about form and function but also the attractiveness or how pleasing the animations are to the eyes of the user. Aesthetics and attractiveness impacts student attitudes towards using an animation [19].

5. Research Approach

This research was an action research, because it was a quick survey and utilized both qualitative and quantitative approaches. The questionnaires used had open and close ended questions. Questions for students and lecturers were addressing the same issues. Sampling procedures was purposeful and random as it was done only at Africa Nazarene University. Thirty students from two departments and twelve lecturers from seven departments/disciplines were interviewed. Time was a limiting factor in selecting larger samples and more universities.

6. Results and Discussions

An analysis of the study findings shows that a huge percentage of students (73%) and lecturers (90%) agree that animations could be used to improve and enhance education and learning of various courses. This is in tandem with the views of Lowe [20] who analyzed

the advantages of animations in learning. Lowe [20]argues that well- designed animations can eliminate the cognitive burden of having to 'mentally animate' the content, so that the learner thinking processes are freed up and can be devoted to educationally worthwhile activity such as the development of understanding.

Approximately 53% of the students admitted to having received some training on how to use PowerPoint and other multimedia presentation skills. They cited Computer application class to be the class that introduced them to this practice. For lecturers, approximately 36% admitted to have received training on using PowerPoint and other multimedia techniques. However, most of them are self taught. Some lecturers came to learn about it in their graduate schools and used them for seminars and conference presentations. Approximately 73% of students questioned in this survey agreed that animations and other forms of multimedia presentations can be used to improve or enhance learning at higher education level. Approximately 81% said that animations and other forms of multimedia presentations can be used to improve or enhance learning at higher education levels. This shows that animation based lectures provide a valuable way to communicate dynamic, complex sequences of physiological events more effectively than text or a static graphic [10, 11].

Respondents who supported this notion said that animations and multimedia presentations will be easier to interpret, provide illustrations that support easy learning, and enhance interactivity. This could be attributed to the fact that this generation is a visual generation and therefore there is a tendency to understand more what students can see than audio alone or static images. It was also pointed out that lecturers need training, equipment (hardware and software) to develop and apply appropriate animations in the context of their courses and disciplines.

7. Conclusions and Recommendations
From the finding discussed above, this paper concludes that:
1. The perception of students and facilitators in regard to the use of animation in teaching and learning at Africa Nazarene University is positive. They said it is a good thing and should be encouraged.
2. The readiness of students and facilitators in regard to the use of animation in teaching and learning at Africa Nazarene University is average.
3. There is need for training, availability of equipment (hardware and software) to develop and apply appropriate animations in the context of their courses and disciplines.
4. Animation effectiveness has not been fully exploited in all areas of learning domains, a review of the literature reveals the vast majority of researchers interested in animation come from a cognitive background, and unsurprisingly therefore most of our knowledge about the effects of animation is also framed in cognitive terms. Whilst there is little doubt about the importance of cognitive accounts of learning with animations, more research is needed elsewhere as relatively little is known in comparison about expressive, perceptual, affective, strategic, met cognitive and rhetorical levels of explanation.

Based on these conclusions, the authors of this paper recommend that:
1. Animations should be used together with other methods to support teaching and learning therefore the facilitator can use it when it is appropriate.
2. Facilitators and students should use PowerPoint frequently and more training is required to ensure the master the skills.
3. Animations should be designed well to reflect the unit information they are representing
4. Universities in Kenya should properly equip their classrooms and probably design smart classes.

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