

Satisfaction of Distance Education University Students with the Use of Audio Media as a Medium of Instruction: The Case of Mountains of the Moon University in Uganda

Mark Kaahwa, Chang Zhu, Moses Muhumuza

Abstract—This study investigates the satisfaction of distance education university students (DEUS) with the use of audio media as a medium of instruction. Studying students' satisfaction is vital because it shows whether learners are comfortable with a certain instructional strategy or not. Although previous studies have investigated the use of audio media, the satisfaction of students with an instructional strategy that combines radio teaching and podcasts as an independent teaching strategy has not been fully investigated. In this study, all lectures were delivered through the radio and students had no direct contact with their instructors. No modules or any other material in form of text were given to the students. They instead, revised the taught content by listening to podcasts saved on their mobile electronic gadgets. Prior to data collection, DEUS received orientation through workshops on how to use audio media in distance education. To achieve objectives of the study, a survey, naturalistic observations and face-to-face interviews were used to collect data from a sample of 211 undergraduate and graduate students. Findings indicate that there was no statistically significant difference in the levels of satisfaction between male and female students. The results from post hoc analysis show that there is a statistically significant difference in the levels of satisfaction regarding the use of audio media between diploma and graduate students. Diploma students are more satisfied compared to their graduate counterparts. T-test results reveal that there was no statistically significant difference in the general satisfaction with audio media between rural and urban-based students. And ANOVA results indicate that there is no statistically significant difference in the levels of satisfaction with the use of audio media across age groups. Furthermore, results from observations and interviews reveal that DEUS found learning using audio media a pleasurable medium of instruction. This is an indication that audio media can be considered as an instructional strategy on its own merit. Generally, from the findings of this study, the conclusion is that apart from educational levels, other students' characteristics are not critical regarding their satisfaction with audio media in distance teaching.

Keywords—Audio media, distance education, distance education university students, medium of instruction, satisfaction.

I. INTRODUCTION

It is pedagogically unsound for any institution of higher learning to rely on one instructional strategy because of the pitfalls associated with a single medium of instruction. A combination of instruction methodologies compensates for

these pitfalls and maximizes learning outcomes. This is consistent with [1] who pointed out that effective use of podcasts can be achieved by integrating podcasting with existing pedagogies. It is proposed that teachers can use podcasts in classroom teaching, follow-up discussions, learning tasks and assessment. The present study uses audio media to mean a combination of live interactive radio lectures and podcasts (recorded lectures uploaded unto Moodle platform). Although audio media is now widely being used at high institutions of learning, it is vital to investigate the satisfaction of learners who use these strategies in teaching-learning process. Research indicates that satisfaction has become a measure to assess training effectiveness in companies and learning effectiveness in teaching. It has been often used as one of the important parameters to judge students' attitude in researches related to learning and assess learning effectiveness in the academic institution [2]. In the present study, satisfaction is used to mean happiness, gratification and pleasant feelings students derive from the use of audio media as a medium of instruction in distance education. However, there is little information regarding whether students find audio media pedagogically beneficial to their learning. Their feelings and attitudes regarding this instructional strategy have also not been sufficiently investigated. According to [3], students' satisfaction refers to the "favorability of a students' subjective evaluation of the various outcomes and experiences associated with education". However, in this study, satisfaction of students was assessed regarding how DEUS appreciated audio media as a medium of instruction. Students were asked how satisfied they were with radio instruction, podcast quality, podcast accessibility, podcast efficiency, technical support, podcast interactivity and general satisfaction with audio media.

Study findings by [4], show that students' satisfaction can determine whether they like to use educational technologies or not, how learners work together, and whether there is a good working atmosphere among learners. However, [4] investigated satisfaction from the perspective of Online Collaborative Learning, but the present study focuses on learners' satisfaction regarding the use of audio media (radio instruction

Mark Kaahwa is a Ph.D. Scholar at Vrije Universiteit Brussel in Belgium. He is also a Lecturer at Mountains of the Moon University in Uganda (e-mail: mrkcosta@yahoo.com).

Chang Zhu is a Professor at the Faculty of Psychology and Educational Sciences- Vrije Universiteit Brussel in Belgium.

Moses Muhumuza is Associate Professor at the Faculty of Science and Technology-Mountains of the Moon University in Uganda.

supplemented by podcasts) in distance education. One study found out that almost all the students were satisfied with the number of podcasts given to them throughout the whole duration of the course. The number was appropriate, not too few nor too many. In addition, learners showed that podcasts turned out to be beneficial by boosting their interest in the entire teaching-learning process [5]. Study findings by [6] show that learners found podcasting to be a more effective instructional strategy compared to conventional strategy that involves revision with text materials. Audio material helped them to revise more than their own notes. They also indicate that they are more interested in the learning material in the form of a podcast than the text materials in a traditional lecture or textbook. Podcasts as revision instruments were found to be pedagogically beneficial to undergraduate students especially in connection with the time they take to revise and how much they can learn and comprehend content.

Audio media is a valuable method for capturing and presenting academic information to students especially those in resource-poor contexts, for audio media can be used with limited or no internet at all. According to [7], audio media has a demonstrated capacity to facilitate authentic students' engagement, allowing students to connect in various ways to the content beyond the classroom environment. Creation and production of this audio content is not costly nor is it difficult for institutions; it can easily be created with many desktop tools and small digital recording devices such as smartphones. However, there is limited empirical research that has studied the satisfaction of DEUS regarding the use of audio media and thus the need for the present study. In this study, we focus on the following research questions:

1. What are the gender differences among DEUS regarding their satisfaction with audio media as a medium of instruction?
2. Are there differences in satisfaction regarding audio media as a medium of instruction among diploma, degree and postgraduate students?
3. Are there differences between rural and urban-based students regarding their satisfaction with audio media in distance education?
4. Are there differences in age groups regarding the use of audio media by DEUS?

The results from this study are expected to act as an informative reference for educationists as regards satisfaction of students with audio media as a medium of instruction in higher institutions of learning.

A. The Context of the Study

Although audio media as an instructional methodology is an old technology, at Ugandan universities, the technology is relatively new in the distance and other teaching programmes. This study was carried out at a rural-based community University in western Uganda. Although the University has existed for more than a decade, it faces challenges associated with limited internet connectivity, limited computers, and other Information Communication Technologies (ICTs).

This learning environment cannot enable the smooth use of

modern pedagogical strategies like e-learning and other massive open online instructional strategies (MOOIS). Since inception Mountains of the Moon University (MMU) has been using the distance modular teaching approach which combines campus-based face to face teaching and the use of modules, a strategy which has been proven unsuitable in this digital era as students with work and other societal engagements find it hard to enroll under such study programme. The approach has also been criticized by researchers for its short interaction between instructors and learners. For MMU, each course unit in the face to face meeting is allocated 4 hours in a semester. This time is too short for meaningful teaching and learning.

In developing countries and especially among the poor and educationally disadvantaged student populations, audio media approach is considered to be the best approach because students can learn without necessarily coming to campus and without internet as long as they have downloaded audio content on their mobile learning devices. In Uganda, there are multiple FM radio stations, in each region, there are about 100 FM radio stations reaching various rural communities. This is a huge resource if it can be tapped for educational purposes. Whereas previous studies have been done on the use of audio media in distance education for example [8]; [9], no study has been done that combines live radio lectures and podcasts as an independent medium of instruction. Therefore, before rolling out the instructional methodology, the satisfaction of students regarding the study methodology needed to be investigated.

B. Statement of the Research Problem

Although the growth of audio media as a medium of instruction has been significantly high in the recent years, its application and adoption have been relatively low in Uganda. Studies that combine radio teaching supplemented by recorded lectures (podcasts) as an independent teaching methodology have not been fully investigated. This is consistent with [10] where they pointed out that not all e-learning technologies are used in teaching and learning process. In their study, they did not find audio media being used as an instructional strategy by any of the studied universities in Uganda. This means that audio media has not yet been adopted in its entirety and thus it remains to be established whether students are satisfied with this medium or not.

This study was conducted in a rural and resource-poor setting characterized by poor internet connectivity, limited access to household ICTs, limited electricity especially in the rural areas where most of the students reside. This is consistent with the findings of [11] where the percentage of homes in advanced countries that are connected to internet doubles the homes in developing countries. It is surprising to note that not more than 15% of households in developing countries have access to regular internet. In these countries, many internet users are accessing the internet from work, schools, and universities or from other shared public connections away from home. These conditions are not any better in Uganda and the use of audio media in distance teaching is presumed to bridge these gaps. However, any instructional strategy to yield the desired learning outcomes the beneficiaries must appreciate and accept it.

Nevertheless, it is not known whether DEUS at MMU will appreciate and adopt this methodology and thus the need to investigate their satisfaction regarding the use of the medium in distance teaching.

C. Research Objectives

The study aimed at investigating the satisfaction of DEUS regarding the use of audio media as a medium of instruction. Satisfaction was assessed in each of the 6 scales (satisfaction regarding radio instruction, satisfaction regarding podcast quality, satisfaction regarding podcast accessibility, satisfaction with podcast efficiency, satisfaction with technical support and satisfaction regarding podcast interactivity).

D. Specific Objectives

This study sought to achieve the following objectives:

1. To investigate gender differences among DEUS regarding their satisfaction with audio media as a medium of instruction.
2. To investigate differences in satisfaction regarding audio media as a medium of instruction among diploma, degree and postgraduate students.
3. To establish differences between rural and urban-based students regarding their satisfaction with audio media in distance education.
4. To find out satisfaction differences in age groups regarding the use of audio media by DEUS.

II. LITERATURE REVIEW

A. Gender Differences among DEUS Regarding their Satisfaction with Audio Media

Experiences and practices with different uses of podcasting in higher education have been reported from across the world and in many scientific fields. In the study by [3], a number of aspects that can be used to measure the academic worth of podcasts are pointed out. These include; learners' satisfaction, academic achievement, teacher satisfaction and financial viability. This paper among others is concerned with the first aspect, where we investigate students' satisfaction with audio media in relation to their demographic characteristics such as gender, academic levels, residence status, and age. Most of the earlier research investigated gender differences in regard to ICT usage in education, however, few experiential studies have studied an aspect of gender differences of higher education distance students regarding audio media as a medium of instruction in distance education. In his study Efuwape notes that, there were no differences in regard to gender concerning learners' interest, appreciation and usage of computer-assisted learning approaches [12]. His findings are consistent with [13], who observed that men and women had similar competences regarding the use of computer-based teaching. However, it was found out that, they had different insights and attitudes towards computer use. Efuwape also notes that men more than women while deciding on the use of a new technology consider so much the aspect of perceived usefulness on top of other enabling factors. Nevertheless, the study never found any gender

differences in the acceptance and use of a new technology. The results of the study conducted by [14], indicated that there was no statistically significant mean difference among motivational beliefs, self-regulated learning variables, and achievement with respect to gender. One of the main results expressed that female and male students' motivational beliefs, self-regulated learning variables and achievement did not differ in the online programming course.

Studies found that majority of learners irrespective of gender they would like to continue using podcasts in other subject areas at the university because they are able to use them at any time and from anywhere without any hindrance [15]. Podcasting, which has the potential for mobile use, is the ultimate flexible learning resource as it may be used while in transit or movement. Taylor further observes that students liked the informal, relaxed tone of their lecturer speaking to them. They describe this as "personal" and said it made them feel they were having some kind of "one on one "consultation with their lecturer. The present study went a step further to study students' gender differences regarding DEUS satisfaction with audio media. Podcasting was viewed favorably by undergraduate nursing students for providing flexibility and increased access to course content while having no significant impact on learning outcomes as measured by examination scores [16]. Nevertheless, here the author assessed the effectiveness of podcasting by looking at the students' learning outcomes without considering their satisfaction based on gender differences. The focus of the present paper, therefore, was among other things to assess gender differences among DEUS regarding their satisfaction with audio media. In one study, male students had a greater preference for learning with technology and 57 percent of them indicated that the use of technology in courses enhanced their learning [17]. In contrast, a lesser percentage of 41 female students felt that technology use improved their learning. In the present study, students used electronic mobile devices such as smartphones, tablets, laptops and other MP3 players to revise the audio content for the courses that were selected for this study. However, it is not known whether there are gender differences in terms of their satisfaction with audio media and thus partly the need for this study. The reviewed literature shows that, most learners find the use of podcasts inspiring since many of them study through distance learning programs, and may not have enough time to attend the regular face-to-face campus-based teaching. However, it is not indicated whether or not there are gender differences in the audio media preferences of students, and partly this prompted the current study.

B. Student's Satisfaction with Audio Media in Relation to Their Academic Levels

In this objective, literature was reviewed based on the differences regarding audio media satisfaction among diploma, degree and postgraduate students:

University students indicated that the use of audio content does not only improve learning experiences but supplements campus-based teaching and positively affects the teaching-learning process [18]. From this study, students identified that

the provision of audio material following and preceding an English language class can have valuable academic results. Contrary to this author, in the present study, we investigated students' satisfaction with audio media as an independent medium of instruction. In this study students never had campus-based face-to-face teaching. Students followed lectures through live radio broadcasts and these were supplemented by podcasts. And thus, it is not known what kind of sentiments students hold regarding this methodology and thus the need for this study.

Flexibility and particularly freedom of movement was pointed out by undergraduate students as an academic benefit of recorded lectures. This among others referred to the possibility of listening to recorded content while carrying out other tasks in a location of their choice other than being fixed to a classroom environment. The accessibility of podcasts at home, for instance, gave them a chance to simultaneously take on other activities such as household tasks. Indeed, one student admitted: *"No useless traveling to the University, it is possible to listen at the time and place of my choice"* [19]. According to the study carried out at a Bangladesh University in the Business School by Karim [20], almost all graduate students have direct access to radio. Research findings show that 86.25 percent of graduate students listen to radio programme of the School of Business of Bangladesh Open University and 50 percent of them find it pedagogically beneficial in their academic pursuits. A less percentage of 13.75 of the students could not listen to radio programmes on a regular basis. More than half of the students indicated that the radio programmes are easy to comprehend. The author in this study did not investigate the satisfaction of students as regards a combination of radio teaching with podcasts and therefore in the present study both undergraduate and graduate students of Mountains of the Moon University were taught for one semester through the radio and instead of modules and other text materials they were given podcasts for revision, therefore it is not known whether the students found this medium of instruction satisfactory and interesting and thus the need for this study. The research by Maag [21], indicates that both undergraduate and post-graduate students continue to report great value in having the lecture recorded and pushed to their computers and subsequently to their MP3 audio devices. Students reported that they learn better if they hear the learning material more than once, and the lecture podcasts assisted them in grasping and comprehending academic information. One student remarked how the availability of the lecture podcasts gave her the opportunity to "listen and learn" while exercising on the treadmill at the gym, therefore allowing her to return to her exercise regularly. Some of the other students indicated that recorded lectures are helpful while reviewing lecture notes before examinations. One student stated that; *"It helps me a lot because I can't always write as fast as you talk;"* *"It is helpful to be able to listen to it again to refresh ideas in your mind"*. This way little details that you might have missed the first time are recognized and stay in your memory longer. These findings are supported by another study where it is observed that the attitudes and views of students towards podcasting were positive and students further believed that this medium can be helpful if it mixes cautiously into

language learning environment [22]. The author here does not look at the combination of radio teaching and podcasts and again the study does not investigate satisfaction based on the academic levels of the learners. In the current paper learners' satisfaction with audio media is investigated with a focus on the academic levels of students. The paper among other things sought to establish if there exist differences in satisfaction with audio media among diploma, degree and Post-graduate University students.

Faramarzi [22], observes that since the recorded content can be re-played and listened to at any time, students indicated that podcasts are thus key in revising for exams and can also compensate the missed lessons. In the study conducted by [23], involving undergraduate education students from Melilla University, the evaluation of podcast integration into conventional teaching was seen as an important factor of quality enhancement and academic innovation. However, the author in this study used podcasts as a supplement to face-to-face traditional campus-based teaching but in our present study, lectures were delivered via radio and podcasts were given to students as revision materials. This was used as an independent medium of instruction and thus investigating students' satisfaction is an important aspect if the instructional strategy is to be adopted in distance teaching and learning. Academic staff and undergraduate students at Leeds Metropolitan University in the United Kingdom observe that podcasts are instrumental in raising students' motivation to study and appealing to different learning interests of university students [24]. Nevertheless, we have found that the students prefer flexibility to movement. In other words, the students regard it very beneficial to listen to podcasts outside classroom time, either because a class was missed or because they want to review and memorize the key concepts of the taught content. In a study of 183 undergraduate students on video, audio and graphics effects, it was noted that these can capitalize on the contemporary rich media environment and contribute significantly to learning. However, for academic staff, production of quality podcasts with clear voice projection and regulated speed inescapably leads to more workload. In this regard, for successful adoption and implementation of audio media teaching, the institution in question must without fail provide technical support to faculty [25]. Generally, the findings indicated that podcasts enabled the students who participated in this study achieve personalized learning. They regarded podcasting as a platform that provided additional learning materials to support conventional teaching.

C. Differences between Rural and Urban-Based Students Regarding Their Satisfaction with Audio Media

Learners from remote areas notwithstanding their academic levels, normally have academic limitations relating to inadequate instructional resources. Unlike their urban-based counterparts, such learners may not appreciate and feel satisfied with certain didactical innovations. Well aware of this, this study, sought to investigate if there are any differences between rural and urban-based students as regards their satisfaction with audio media as a medium of instruction.

Previous research has shown that there are significant

differences between rural and urban-based students regarding their satisfaction with educational radio. Majority of urban students unlike their rural counterparts do not appreciate the pedagogical value of radio in teaching and learning process [26]. It is not known, however, if there are significant differences in terms of satisfaction by DEUS from rural and urban settings regarding the use of audio media in a Ugandan context and thus the need for this study. Regarding podcasts, Ting [27], indicates that students agreed that podcasts as educational tools are quite beneficial in facilitating listening skills. Some students observed that podcasts also are important in speaking and writing because they could use sentences from the podcasts in their academic tasks. One student stated; *"podcasts help me learn and listen to English while I wait for a train."* The same student further noted that, *"I could use my time for learning English without being under any pressure"*. In this study, the author never draws a distinction between urban and rural students regarding their satisfaction with podcasts. Since rural and urban-based students hail from two distinct environments with differing levels of accessibility to instructional materials, it is better to establish if they have differences in their levels of satisfaction and thus the present paper intended to address that gap. Fietze [28], studied students' practices and experiences with podcasts and generally they regarded lecture podcasts as pedagogically beneficial and a valuable addition to campus-based instruction. 83.7 percent of students regarded podcasts which can be downloaded to supplement their lectures as very key to traditional teaching. Nevertheless, Fietze did not examine students' satisfaction with podcasts combined with radio instruction, furthermore, the author never examined satisfaction differences regarding audio media between rural and urban-based students. The present study partly intended to fill such gaps.

D. Satisfaction Differences in Age Groups Regarding the Use of Audio Media by Distance University Students

Age is another factor sometimes thought to impact on podcast use [29]. Given suggestions for age-related differences in educational expectations and descriptions of Gen Y as "digital natives", the influence of age on podcasting has been investigated. Scholars have always asked; Do younger students have more positive attitudes to podcasting than older students? In this regard, research supports few age-related differences. Chester also observed only two age-related differences as regards podcast usage in teaching and learning process. It was observed that mature students preferred to use recorded lectures at their own convenience and unlike young students did not mind using podcasts even when the instructor did not speak as clearly as required. Such differences in the age groups among DEUS regarding their satisfaction with audio media at MMU have not been fully investigated and thus the need for this study. Oblinger, [30], observes that different generations differ in their outlook for teaching and learning processes. The Net generation, for example, has caused a lot of debate among researchers because it is quite distinct from Matures born between 1900 and 1946, Baby Boomers born between 1946 and 1964 and Generation X born around 1982 and beyond. The Net

generation is advanced in the use of educational technologies compared to the other generations. The explanation for this is that this generation is born at a time when we have computer explosion. So they have been born and grown up surrounded by ICTs. In the present study, however, among others, we examined age differences in terms of audio media satisfaction among the following age groups: 1. 20 to 29 years, 2. 30 – 39 years, 3. 40 – 49 years, 4. 50 years and above. The students used electronic mobile devices such as smartphones, portable laptops, iPods and other MP3 players to listen to the audio content of the various courses that were selected for this study.

Student satisfaction with online learning demonstrates our assumptions about online learning. The study from the University of central Florida indicates that, although Computer-savvy and young students are regular online, they do not have high interest in web-based courses [30]. Findings of another study show that grownup students are more likely to appreciate technology-based programmes than young generation students [31]. The majority of the students who participated in the present study are old students (30 years and above) this is because they are upgraders who have been in the field for quite some time, however, it is not known whether they differ in terms of their satisfaction with audio media in comparison to their counterparts who are relatively young (30 years and below) and thus this study sought to establish that as shown in the results section. Richardson [31] observes that unlike young learners who prefer supportive and real-world learning environment, older students are more interested in behaviourist setting. Older students compared to younger students usually find online learning complicated and often it affects their satisfaction and motivation to learn. On the other hand, younger students who are more sharp and knowledgeable about computers find online learning more interesting and enjoyable. In one study, it was found that younger students exhibited more satisfaction in their online instruction compared to their older counterparts [32]. Since audio media is a computer-assisted teaching strategy, it is not known whether university students prefer it or not. Furthermore, there is need to note that audio media is not new in higher institutions of learning world over, but in Uganda, the technology is at its infancy stages and the acceptance and satisfaction by students remain quite unclear to educationists. Previous studies mostly focused on the satisfaction of learners with fully fledged online learning. In the present study, though audio media required students to be online to download podcasts, this was done for a limited time and they spent most of the time either listening to audio content offline or listening to live radio lectures. Satisfaction of students with this kind of instructional strategy has not been fully investigated and thus the need for this study.

III. STUDY METHODOLOGY

A. Sample and Sampling Procedure

This study was conducted from the Mountains of the Moon University in western Uganda. Purposive sampling technique was used to select 211 DEUS from the School of Education, School of Health Sciences and Directorate of post-graduate

Studies and Research. Only students enrolled in distance programme were included in this study. The consent of participants was sought before they were invited to participate in this study. Permission to involve participants in this study was granted by the School Deans. For purposes of confidentiality and anonymity participants were advised to use pen names during the interviews.

All the participants were inexperienced in the use of audio media, and this was their first encounter with this medium. Audio media workshops were organized where participants were oriented on how to use audio media in distance education. Participants were instructed in creating usernames and passwords and were also taught how to sign in and download podcasts onto their mobile gadgets. A total of 59 podcasts of between 25 to 30 minutes for Health services management, Primary Healthcare, oral literature, Project planning & management, Economics of Education & Early childhood education were uploaded on the University Moodle platform. For inclusion in the study, participants were required to have portable electronic devices such as laptop computers, smartphones, iPods and other MP3 players. To ascertain the ownership of these devices, a mini questionnaire was administered to all the participants. Only students who owned one or more of the devices were included in this study.

B. Research Tools

A mixed design method including a questionnaire, unstructured observations and interviews was used in data collection. The questionnaire was partly based on the works of [33]. The rest of the items were self-developed. The questionnaire used a 5-point Likert scale ranging from 1 (Strongly agree to 5 Strongly Disagree) to assess students' satisfaction regarding radio instruction, podcast quality, podcast accessibility, podcast efficiency, technical support and podcast interactivity. Unstructured/naturalistic observations and interviews were used to collect qualitative data. The two methods offered deep insights into whether participants felt satisfied with the use of audio media in distance education.

Actions and reactions of all students who participated in the study were observed during audio media workshops and classes. A total of 12 students were interviewed drawing 2 female and 2 male respondents from each of the two schools and one directorate. Interviews were recorded and later transcribed by the principal investigator. The key questions asked were: 1. *How helpful was the audio media in your learning process*, 2. *What was your overall satisfaction with audio media?*

C. Materials & Equipment

The study used Mountains of the Moon University FM Radio 105.2 "Amagezi Murro", for the live broadcast lectures to DEUS. Although a classroom furnished with a home theater that transmitted the live radio lectures was arranged for students, they were free to attend from different geographical spaces and learning centres. Learners were given a chance to ask questions or make contributions by either calling in using a studio line or sending WhatsApp messages or audio clips to the

instructor in the studio. After lectures, DEUS studied and revised content using podcasts downloaded from the Moodle platform. Wave Pad sound editor was used to edit recorded lectures. Wave Pad sound editor is a free full-featured professional sound editor for Windows that lets you create and edit voice and other audio recordings. In the present study, the podcasts played a supplementary role to radio teaching.

D. Participants

The study included a total of 211 DEUS. Out of these 123 (58.3%) were males and 88 (41.7%) were females. Participants were drawn from School of Education, School of Health Sciences and Directorate of Post-graduate Studies & Research. Participants were aged between 20-29 (20.9%), between 30-39 (48.8%), between 40-49 (26.5%) and those aged 50 and above (3.8%). Participants from these Schools and Directorate were selected because of being enrolled in distance education programme.

E. Reliability of the Instrument

Reliability of the instrument was tested. Results measuring the internal consistency of the items are indicated in Table I:

TABLE I
RELIABILITY RESULTS FOR THE INSTRUMENT

Items	No. of items	Cronbach's alpha
Satisfaction regarding radio instruction	10	.913
Satisfaction regarding podcast quality	16	.68
Satisfaction regarding podcast accessibility	05	.864
Satisfaction regarding podcast efficiency	10	.854
Satisfaction with technical support	04	.915
Satisfaction regarding podcast interactivity	05	.920
General satisfaction with audio media	03	.878
Overall Cronbach's Alpha	43	.860

In Table I, the overall reliability coefficient stands at .860 and this is an indication that the internal consistency is very high and thus the instrument was reliable for use in the collection of primary data.

F. Statistical Analysis

Descriptive statistics were used to analyze demographic data of the respondents. The researchers ran Likert means to find out the general satisfaction of DEUS with audio media regarding their gender and residence status. To find out if there were any significant differences in terms of gender and residence status, we ran T-tests. A one way-ANOVA between subjects was conducted to establish satisfaction of students with audio media regarding their age groups and academic levels. The results from the ANOVA table show that there is a statistically significant difference in the levels of satisfaction between Diploma students, degree students, and graduate studies students, posthoc test was further run to establish where the differences occurred between groups. Qualitative data were transcribed and included in this study. Based on the nature of the study, a deductive approach to the content analysis was employed. In this approach, pre-themed questions were used to

group the data and then look for similarities and differences. Coding was done within themes. Specific students' quotes from the interview transcripts were included in this study to further support findings of the quantitative data.

IV. RESULTS

This part presents the results of the study beginning with the quantitative findings which are further illustrated by the qualitative results. Interviewed participants are given short codes as pseudo names, for instance, EDS1 for respondent 1 education student, PHS1 for respondent 1 Public health student and PGS2 for respondent 2 Post-graduate student.

A. Demographic Statistics

The study was conducted among 211 DEUS, 123 making 58.3% of the participants were males and 88 participants making 41.7% were females. Thus, in this study, there were fewer females than males. Students were also required to indicate their age groups and 20.9% were aged between 20-29, 48.8% were aged between 30-39, 26.5% were aged between 40-49 and only 3.8% were aged 50 years and above. 28% of the students that participated in the study were diploma students, 52.6% were degree students and 19.4% were graduate studies students. The study participants were also required to indicate their nationality and 92.4% were Ugandans and 7.6% were international students. 65.4% of the respondents are residents in the rural areas and 34.6% are residents in Urban/Town-based areas. Students that participated in the study were required to indicate the device they used to revise audio content and 6.2% used tablet/iPod, 56.9% used smartphones, 23.2% used laptops and 13.7% used any other MP3 player.

B. Gender Differences among DEUS Regarding Satisfaction with Audio Media

The findings of the study (Table II) show high levels of agreement among the students regarding their satisfaction with audio media as a medium of instruction. This is evidenced by all the Likert means that are less than three. Both male and female students indicated that they were highly satisfied with the podcast efficiency. After carrying out T-tests to find out if there was any significant difference in levels of satisfaction between male and female students, the results show that there was no significant difference in the levels of satisfaction between male and female students. However, there was a significant difference in the level of satisfaction regarding radio instruction between males and females since the computed alpha is less than the significant alpha (0.05). The male students are more satisfied with radio instruction compared to their female counterparts with a lower Likert mean. However, this was hardly reflected in the observations; we rather observed that irrespective of their gender, both male and female students actively participated in audio media classes. They were seen busy taking notes and some, either sent in messages or called direct through a studio line to ask questions or make contributions during radio broadcasts. Furthermore, results from the interviewed

students indicate that both female and male students found audio media an interesting medium of instruction. Majority of students liked this medium because of the flexibility associated with it. Many compared it with the traditional campus-based teaching that combines face-to-face and modules. For example, one female respondent noted that:

"You don't need to carry all the books and modules.

When you listen to the podcasts you get a wide range of understanding of the content" **EDS1 (Personal interview on 17th March 2018).**

Another female student had this to say:

"It helped to save my time, when we are given modules in most cases we don't read them till last minute [...] with my smartphone and earphones, I could revise while moving in the car, I could revise any time and people could not know what I am listening to. I revised till the last minute of exams" **PHS2 (Personal interview on 17th March 2018).**

Study participants indicated that audio media made their revision easy while preparing for their examinations. The medium did not only improve their hearing and listening skills but enhanced their understanding of concepts in the taught module. One male post-graduate student stated that:

"It assisted me to gain hearing and listening skills, it also assisted me to understand concepts in the module, I kept replaying it at any time I wanted, I could pause and search other sources like internet and dictionary in case of hard concepts" **PGS 1 (Personal interview on 18th March 2018).**

Another perceived benefit of audio media by study participants was the fact that they could study anytime and from anywhere. One female in-service student pointed out that:

"Frankly speaking, I can say audio media helped me so much because even when I would be teaching at school, I could quietly use my earphones to play podcasts. So, I could revise while marking pupils' work. With audio media, learning has no limits, you are as limited as your interest" **PGS 3 (Personal interview on 18th March 2018).**

Interviewed students irrespective of their gender, frequently mentioned that audio media as an instructional strategy turned out to be very helpful especially when it came to revise for end of semester examinations. This is evidenced by what one respondent stated regarding general satisfaction with audio media.

I felt highly satisfied to use audio media because I listened quietly in my room and would even listen to my lectures in the office using my earphones. This enabled me to grasp the information better than it would have been with the face to face method ..." **EDS 2 (Personal interview on 17th March 2018).**

C. DEUS' Satisfaction with Audio Media in Relation to their Academic Levels

The results in (Table III) indicate that all diploma, degree and graduate students indicated high levels of agreement

regarding their satisfaction with the use of audio media as a medium of instruction. The results from the ANOVA Table III show that there is a statistically significant difference in

the levels of satisfaction between diploma students, degree students and graduate students since the computed P-value (0.002) is less than the significant alpha (0.05).

TABLE II
RESULTS FOR GENDER DIFFERENCES AMONG *DEUS* REGARDING SATISFACTION WITH AUDIO MEDIA

	Male		Female		Sig...
	Likert mean	Standard deviation	Likert mean	Standard deviation	
Satisfaction regarding radio instruction	2.13	1.4	2.29	1.14	0.04*
Satisfaction regarding podcast quality	2.15	1.2	2.26	1.4	0.06
Satisfaction regarding podcast accessibility	2.3	1.1	2.5	1.4	0.12
Satisfaction with podcast efficiency	1.86	0.9	1.87	0.8	0.07
Satisfaction with technical support	2.6	1.5	2.5	1.4	0.11
Satisfaction regarding podcast interactivity	2.2	1.2	2.2	1.2	0.08
General satisfaction with audio media as a medium of instruction.	2.2	1.3	2.2	1.2	0.08

*means that the difference in Likert means is statistically significant.

TABLE III
RESULTS OF STUDENTS' SATISFACTION WITH AUDIO MEDIA IN RELATION TO THEIR ACADEMIC LEVELS USING ANOVA TEST

Source of Variation	Av	Var	SS	df	MS	F	P-value	F crit
Diploma	1.99	0.07	-	-	-	-	-	-
Degree	2.23	0.06	-	-	-	-	-	-
Graduate	2.53	0.05	-	-	-	-	-	-
Between Groups	-	-	1.035	2	0.517	8.813	0.002	3.554
Within Groups	-	-	1.057	18	0.058			
Total			2.092	20				

Key: Av: Average, Var: variance

To confirm that the ANOVA table for a single factor is true at 95% confidence level (5% level of significance), post hoc analysis was run to find out which mean is significantly different from the other. Post hoc results (as shown in Table IV) revealed that diploma students are more satisfied with audio media than their graduate counterpart.

But there is no significant difference in the level of satisfaction between diploma students and degree students regarding the use of audio media as a medium of instruction. In our observations, we never noticed any differences between groups. All students irrespective of academic levels attended audio media classes regularly, made calls to the radio studio while their instructor presented the lesson, and many were seen actively engaged in jotting down content during the live radio broadcasts. Interview results do not show any differences either. Interviewed students showed a high interest in audio media as a medium of instruction. One diploma student indicated that:

"This audio media does not stress me, I only need to sit in a relaxed mood and listen to the presentations. Reading is very stressful especially if you don't have

enough time like us distance students" EDS3 (*Personal interview on 17th March 2018*).

Another benefit associated with audio media was to regularly hear the voice of the lecturer. One respondent pursuing degree programme stated that:

"Surely, I like audio media especially recorded lectures, it is as if the class is continuing unlike when you are reading from modules, where you cannot hear the voice of the lecturer" PHS3 (*Personal interview on 17th March 2018*).

Similar sentiments were expressed by graduate students and one of them pointed out that:

"Audio media was very important because it made me to be more attentive, it helped me to concentrate more than it would have been with campus-based teaching" PGS2 (*Personal interview on 18th March 2018*).

These responses show how highly audio media is regarded by distance students, this perhaps is because of the flexibility associated with it. And because of the limited time these students have on campus. With podcasts, they can study anytime and from anywhere.

TABLE IV
POST-HOC TEST RESULTS REGARDING DIFFERENCES OCCURRED BETWEEN GROUPS

	Post hoc test Between Diploma and Degree		Post hoc Test between Diploma and Graduate		Post hoc test between Degree and graduate	
	Diploma	Degree	Diploma	Graduate	Degree	Graduate
Mean	1.99	2.23	1.99	2.53	2.229	2.529
Variance	0.07	0.06	0.07	0.05	0.056	0.049
P(T<=t) two-tail	0.10		0.001*		0.030	
t Critical two-tail	2.18		2.18		2.179	

D. Differences between Rural and Urban-Based DEUS Regarding their Satisfaction with Audio Media in Distance Education

Students were required to indicate their levels of satisfaction with audio media as a medium of instruction according to their places of residence. The students that reside in urban areas indicated high levels of agreement compared to the students that reside in rural areas with lowest Likert means on almost all the parameters of measurement. After carrying out T-tests to find out if there was any statistically significant difference in the level of satisfaction between the two groups, the results in (Table V) show that there is no significant difference in the general satisfaction with audio media as a medium of instruction between the two groups. However, for podcast accessibility and technical support, there is a significant difference in the level of satisfaction since the computed alphas are less than the significant alpha (0.05). The satisfaction levels for students in urban areas are higher compared to students that reside in rural areas. Results from interviews are not any different, both urban and rural-based students indicated high levels of satisfaction. One respondent from the urban area mentioned that:

"Podcasts save time because you can listen as you are doing other activities and for me, I grasp the content quickly when I listen than when I read" **EDS4 (Personal**

interview on 17th March 2018).

A rural-based respondent had this to say:

"It assisted me because revising content was very easy, topics in the podcast were well explained and thus even before exams I never read any text material, I only listened to the audio content" **PHS5 (Personal interview on 17th March 2018).**

Although generally, students found audio media an interesting medium of instruction. Some students had difficulties and challenges when it came to access podcasts by downloading them from the Moodle platform. One rural-based student had this to say:

"I could have enjoyed listening to the podcasts except I had difficulty downloading them to my phone because of limited internet so I had to get them from some of my colleagues. But all in all, it is a good method of instruction" **PGS3 (Personal interview on 18th March 2018).**

Due to limited internet access, some students from rural areas had to come to the University to be able to download the podcasts. This was not the case with urban dwellers who could find it easy either to buy internet bundles or easily access campus for free internet. This somehow made some students to dislike audio media.

TABLE V
RESULTS FOR RURAL AND URBAN-BASED DEUS REGARDING THEIR SATISFACTION WITH AUDIO MEDIA IN DISTANCE EDUCATION

	Urban		Rural		Sig.
	Likert mean	Standard deviation	Likert mean	Standard deviation	
Satisfaction regarding radio instruction	2.3	1.1	2.4	1.1	0.20
Satisfaction regarding podcast quality	2.2	1.3	2.1	1.2	0.26
Satisfaction regarding podcast accessibility	2.3	1.1	2.5	2.1	0.01*
Satisfaction with podcast efficiency	1.8	1.0	1.9	0.8	0.08
Satisfaction with technical support	2.5	1.5	2.7	1.4	0.02*
Satisfaction regarding podcast interactivity	2.2	1.3	2.3	1.2	0.06
General satisfaction with audio media as a medium of instruction.	2.1	1.3	2.3	1.2	0.06

*means that the difference in Likert means is statistically significant.

E. Satisfaction Differences in Age Groups Regarding the Use of Audio Media by DEUS

The ANOVA results in (as shown in Table VI) show that there is no significant difference in the levels of satisfaction with the use of audio media as a medium of instruction across age groups since the computed P-value (0.423) is greater than the significant alpha (0.05). Interview results do not indicate any satisfaction differences across age groups. For example, one middle-aged student indicated that:

"I personally enjoyed this medium, the lecturer was moving at a good pace and I made good notes in summary form and this assisted me to revise and perform well in the exam. I must say I am excited about this teaching method" **PGS3 (Personal interview on 18th March 2018).**

A frequently mentioned benefit of audio media was to study anytime and from anywhere. For example, a student in the early 20s indicated that:

"The teaching method is good because you can access lecture information anytime you want, secondly it is easy to keep lecture information, unlike bulky modules. All information can be saved on the smartphone or any other MPS player" **EDS3 (Personal interview on 17th March 2018).**

All interviewed students irrespective of age showed that they were satisfied with audio media as a medium of instruction in distance teaching.

Towards the end of the questionnaire, study participants were asked about the likelihood of recommending audio media as a medium of instruction to their colleagues and 83.9% said that they would recommend audio media to their friends. 85.3% of the respondents indicated that they would most likely continue using audio media as a medium of instruction. Finally, participants were asked about their overall satisfaction with audio media and 82% of the study participants showered that they were happy with audio media. Interview results indicate

that in general students appreciated audio media as a medium of instruction. Regarding whether students would recommend audio media to their fellow students, one respondent had this to say:

“I would highly recommend it because the modules are very bulky, and tasking compared to listening to audio media content. Audio media makes a students’ life simpler, I don’t need to go to university as often as required by traditional teaching methods. I only go there for tests and maybe registration. If lectures are delivered through audio media, then I would just study from home and at my own convenience PGS2 (Personal interview, 17 March 2017).

A public health student pointed out that:

“Yes, I would recommend it to my colleagues, this method should be adopted even by undergraduate full-time students. This could assist them to improve their performance because of its flexibility, you can study any time you want”. PHS5 (Personal interview, 17 March

2017).

Interview responses indicate that students preferred audio media to the traditional modular approach which perhaps is because modular approach involves face-to-face teaching which is very inconveniencing for distance students who combine studies with work. This is confirmed by one respondent who stated that:

“I would recommend this medium of instruction because this was an interesting experience, I wish it was the usual method of teaching, we would not be wasting time to come for face to face teaching and bother ourselves with bulky modules” EDS3 (Personal interview, 17 March 2017).

Although generally, students were satisfied with the use of audio media (radio teaching and podcasts), it is surprising to note that in our observations, some students still preferred the learning material in text form. They searched for notes, handouts, and modules from students of previous years who had used traditional face-to-face teaching.

TABLE VI
ANOVA RESULTS SHOWING DIFFERENCES IN AGE GROUPS REGARDING THE USE OF AUDIO MEDIA BY DEUS

Groups / Source of Variation	Av.	Var.	SS	df	MS	F	P-value	F crit
20-29 yrs	2.27	0.06	-	-	-	-	-	-
30-39 yrs	2.16	0.02	-	-	-	-	-	-
40-49 yrs	2.36	0.08	-	-	-	-	-	-
50 yrs +	2.40	0.17	-	-	-	-	-	-
Between Groups	-	-	0.241	3	0.080	0.969	0.423	3.008
Within Groups	-	-	1.988	24	0.082	-	-	-
Total			2.229	27				

Key: Av. Average, Var. Variation

V. DISCUSSION

This study investigated the satisfaction of students regarding the use of audio media in distance education at a community-based and rural university in Uganda. We developed a questionnaire that used a five-point Likert scale to assess students’ satisfaction regarding radio instruction, podcast quality, podcast accessibility, podcast efficiency, technical support and podcast interactivity. Results from the study indicate that DEUS are excited with audio media as a medium of instruction and majority find it pedagogically beneficial.

A. Gender Differences among HEDS Regarding Their Satisfaction with Audio Media

Understanding gender differences is key for implementing and assessing the effectiveness of audio media as a medium of instruction in distance education, this is because audio media involves the use of Information Technology (IT) which has been found by many researchers to be a scare to girls. This view is supported by [34], whose study indicates that gender difference is often a major concern for researchers interested in students’ abilities and attitudes toward the computer or Web-based learning. It has been argued that female university students were less likely than males to take advantage of computer learning opportunities. Similarly, female students in the study done by Vázquez-Cano [35], demonstrated that they were more anxious about using technology than males, and

were less competent in the use of computer hardware. Contrary to these studies, our results indicate high levels of agreement among students regarding their satisfaction with audio media as a medium of instruction. Both male and female students indicated that they were highly satisfied with the podcast efficiency. Statistical findings are congruent with our observations, where we noted that both female and male students were equally absorbed in all the audio media activities such as listening to live radio lecture broadcasts, calling into the studio and either asking questions or contributing to the lecture, downloading podcasts et cetera. Interview results also showed that just like males, females were also highly satisfied with the use of audio media in distance education. These positive results could be explained by the fact that both male and female students are already used to the mobile electronic devices needed to revise audio content. In this study, a big number of students owned smartphones, and this made it easy for them to have podcasts downloaded unto their phones for follow up and revision at any time and from anywhere. This is in conformity with a study done by [36], where findings indicate that majority of learners were involved in academic activities using their mobile learning devices in other locations other than at home and at the university campus. A majority 67 percent were using their smartphones to learn while travelling as a passenger in a vehicle, and 42 percent were using their tablet computers in the same context.

Study findings indicate no significant difference in the levels of satisfaction with audio media between male and female students. Our study supports the results of Gefen [13], whose report indicated that women and men differ in their perceptions but not use of technology while testing gender differences that might relate to beliefs, acceptance, and use of computer-based media. In this study, it is not surprising, therefore, to find no differences in the general satisfaction of male and female students with audio media. This is because all students were exposed to the same audio media training, all had access to mobile learning devices and used university internet to download podcasts. Another possible reason could be the compulsory introduction to computer course unit for all first-year students enrolling at MMU. It is possible that this course has built the confidence of using ICTs for both male and female students.

However, surprisingly there was a significant difference in the levels of satisfaction regarding radio instruction between males and females. Male students are more satisfied with radio instruction compared to their female counterparts. This could be explained by the tradition and culture in most African societies. Traditionally in African societies, the place of the woman was the kitchen and taking care of all household chores while the man listened to the radio in the living room. Traces of this tradition and culture could have negatively influenced female students regarding radio instruction. This is consistent with the study done by Hartenberger [37] who found that current research points to the motivation to learn as one factor that is clearly influenced by gender expectations. Girls often do not feel capable or do not want to learn skills they perceive as inappropriate for their gender.

The findings of this study could be used as a positive reference for educationists in Higher Institutions of Learning to provide equal opportunities for both male and female students regarding the use of ICTs in web-based instruction especially instruction relating to the use of audio media. The results also challenge gender stereotypes regarding the use of technology in education that still exist in some parts of our society, where female students have been branded to have fear and anxiety about the use of ICTs in education.

B. DEUS' Satisfaction with Audio Media in Relation to Their Academic Levels

In this study, we investigated DEUS satisfaction with audio media in relation to their academic levels. Results indicate that diploma, degree and graduate students showed high levels of agreement regarding their satisfaction with the use of audio media as a medium of instruction. This could be attributed to the fact that all the study participants are part-time university students and listening to their audio lectures while away from campus is a rewarding experience for them. This positive response indicates the potentiality for audio media effectiveness in distance education.

Findings from post hoc analysis show that diploma students are more satisfied with audio media than their colleagues the graduate students. Since in this study, audio media involved the use of information technologies such as laptops, iPods,

smartphones and other MP3s it is not surprising that diploma students are more satisfied compared to their graduate counterparts. That finding could be explained by the study of Marc Prensky about Digital natives and digital immigrants. Diploma students were averagely young compared to their graduate counterparts. Digital natives, unlike the Digital immigrants, represent a cohort of learners that are well acquainted with ICTs, they have used computers both at home and at school since their childhood. They have thus spent their big part of life surrounded by computers, such as laptops, tablets, iPod, video games, cell phones, and all the other ICTs of the digital age [38]. So why the graduate students felt less satisfied with audio media could be perhaps because of the mobile learning devices they had to use to listen to audio content. This could also be explained by the Technology acceptance model (TAM) which postulates that technology acceptance by users is dependent on two factors; perceived usefulness and perceived ease- of- use. It is possible that the graduate students did not see audio media as being useful and easy to use in their studies. This is even further confirmed by our observations where some students had difficulties to effectively use their smartphones to download or locate downloaded audio content.

These results inform the practitioners of audio media that if it is to be used as a medium of instruction especially for graduate students or any other category of students who are of mature age, then more audio media workshops and training are required. Students should be helped to familiarize with the electronic mobile devices and be able to download and play audio content on their mobile devices. Results further revealed that there is no significant difference in the level of satisfaction between diploma and degree students regarding the use of audio media as a medium of instruction. On average, the two categories of students fell within the same age bracket and their positive regard for audio media could also be influenced by the fact that they fall within the Digital native bracket. They find it easy to access and revise audio content using their mobile electronic devices. Nevertheless, interviewed students irrespective of academic levels, they never showed any variances regarding their satisfaction with audio media. This indicates that generally, students were satisfied with audio media as a medium of instruction.

C. Differences between Rural and Urban-Based DEUS Regarding Their Satisfaction with Audio Media

The present study also investigated students' levels of satisfaction with audio media as a medium of instruction according to their places of residence. The students that reside in urban areas indicated high levels of agreement compared to the students that reside in rural areas. This is perhaps because students in urban areas have easy access to instructional resources compared to their counterparts in rural areas. In rural areas, even when students have the required mobile electronic devices to revise the audio content, they are always let down by other factors such as limited or no internet and unsteady power supply. This indeed could affect the way they perceive audio media as an instructional strategy.

However, T-test results showed that there is no significant difference in the general satisfaction with audio media as a medium of instruction between the two groups. Although rural areas in Uganda and most African countries still face challenges of internet and electricity connections, there has been positive changes of late brought about by mobile internet bundles and rural electrification. This is perhaps why we don't have significant differences in terms of audio media satisfaction between rural and urban students. Today rural students unlike in the past can buy cheap internet bundles available even in village shops and this can enable them to surf the internet, download podcasts and listen on their mobile devices or from any other MP3 players. This view is supported by the Freedom on the internet report [39] where it is stated that the steady growth in internet users can be attributed to the increasing use of mobile broadband for browsing.

However, for podcast accessibility and technical support, there is a significant difference in the level of satisfaction. The satisfaction levels for students in urban areas are higher compared to students that reside in rural areas, of course, this explains the fact that despite the internet improvements in rural areas as earlier mentioned, there are still challenges. From observations, it is true some students had challenges of accessing podcasts from the Moodle platform, some had to get the podcasts from their friends who found it easy to download them. From interviews, it is also clear that students had trouble accessing podcasts from the Moodle platform. This, therefore, is an indication that if this medium is to be appreciated and used by students, then educationists and instructional planners should provide sufficient technical support and internet.

Again, from observations made during the audio media workshops, there is the need for full-time technical support. This is because some students have challenges with IT, most of them use their smartphones for basic functions of calling and messaging and some students had difficulties downloading and finding podcasts on their smartphones. This observation is consistent with the study conducted by [36] on the ownership and use of mobile technologies for learning purposes where it was observed that only a few students could use their phones to surf the internet, majority could only use them for elementary functions such as message texting, making and receiving calls.

D. Satisfaction Differences in Age Groups Regarding the Use of Audio Media by DEUS

The present study also investigated satisfaction differences in age groups regarding the use of audio media by DEUS. Findings show no statistically significant difference in the levels of satisfaction with the use of audio media as a medium of instruction across the various age groups. This is in sharp contradiction with the study by [38] who found that whereas Digital natives were born beyond the 1980s a time when ICTs had greatly penetrated almost every part of our society, digital immigrants were born at a time when ICTs were very scarce in our communities. Therefore, because of exposure, the former are more versed with computers than the latter.

According to Prensky, Digital immigrants were born before the 1980s, a period with limited IT facilities and Prensky thinks

that this affected their ability to use the IT equipment and thus eventual dislike of anything associated with the use of IT. In this study, audio media involved the use of computers, iPods, smartphones and other MP3 players. However, this did not affect the satisfaction of even students who could be referred to as Digital immigrants born before the 1980s. Therefore, the reason why we did not get satisfaction differences across age groups, could be because of the prior training that all students were exposed to before the use of audio media. This could have not only equipped them with skills but also gave them the necessary confidence to use the equipment during and after the audio media classes. Our findings are consistent with the study done at the University of Central Florida where results indicate that unlike traditional fulltime campus-based students, part time and older students have higher interest in computer-based university courses [29].

VI. CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

From the study findings, it can be concluded that DEUS find the use of audio media in distance teaching pedagogically beneficial, because students were satisfied with the medium of instruction across age brackets, residence status (Rural and Urban-based), academic levels and across gender. These student characteristics are key indicators for assessing the effectiveness of audio media in distance education. It can further be concluded from the interviewed students that audio media turned out to be a valuable learning experience for most DEUS that participated in the study. Our findings are in line with the study done by Li [33] where all students agreed that podcasts turned out to be very beneficial to them. Podcasts increased their listening skills and they were interested in carrying on these listening habits.

From the experiences and observations during the development of podcasts, it can be concluded that this medium of learning is simple to design and implement compared to other web-based methodologies. This could enable more universities and Higher institutions of learning to adopt audio media as a medium of instruction. This is consistent with [28], who pointed out that the development of software and hardware for private use means that the production of lecture recordings is not reserved solely for institutions with appropriate resources. Anyone with a normal PC and a microphone can publish audio contents over the internet.

The results of the present study could persuade researchers, professors, and academics from resource-poor environments to consider audio media as an instructional strategy that can benefit distance students dispersed over geographical rural spaces facing challenges of the internet and other scholastic facilities.

Based on students' testimonies and our observations, audio media as a medium of instruction makes teaching and learning process an enjoyable and interesting pedagogical activity. This is in concert with Kumar [40], who argues that through the use of ICTs in teaching and learning process, the conventional instructional strategies can greatly be improved and made more interesting to the learners. For instance, a combination of audio, video, power point presentations and text raise the learners'

interest in learning and keeps them focused to the lecture. Interview results provide further evidence to support the results obtained from naturalistic observations and the questionnaire. The findings indicate that almost all the students who participated in the study indicated that audio media is the best way to learn, it made their revision very easy while preparing for their examinations.

Obtained findings of this study will contribute to enriching existing knowledge of audio media where it has only been used as supplementary material to the traditional face to face. In the present study, radio instruction was combined with podcasts to offer an independent medium of instruction and students' satisfaction was assessed in this regard. This knowledge could help instructors that develop and design instructional strategies to consider audio media on its own academic right.

For all the participants of this study, it was their first time to study using audio media, they never had this experience before in their academic journey, therefore we recommend for institutional support if the medium is to be effective in distance education. There is need for an IT technician to offer any necessary technical support to the students and monitor the Moodle platform where the podcasts are uploaded.

Even if this study has achieved its objectives, it has limitations related to a small sample size and only one course unit for each group was used in the audio media instruction. These could have led to unrealistic results. Therefore, a further study with a big sample size and testing satisfaction on more than one course unit is needed. In this study, we also note that while student satisfaction has come out positively there is a need for a further study that correlates satisfaction with students' academic performance.

Although some students used other mobile devices to revise the audio content, a relatively big number of students 57% used smartphones and thus we recommend that smartphones be considered as serious educational tools for all educational institutions intending to use audio media as a medium of instruction. The reason for this is because they are portable and can be used to revise the audio content anytime and from anywhere. Generally, from the findings of this study, we conclude that audio media turned out to be a valuable learning experience for most of DEUS that participated in the study.

ACKNOWLEDGMENT

Appreciation is extended to VLIR UOS IUC Partner Programme with Mountains of the Moon University (MMU) in Uganda that financially supported this research. Special thanks also go to Haruni Machumu from Mzumbe University in Tanzania, Annette Islei from UK and Bosco Bwambale from MMU who spared their precious time to read through this work and make necessary corrections especially relating to grammar.

REFERENCES

- [1] Cheung AC, Slavin RE. How features of educational technology applications affect student reading outcomes: A meta-analysis. *Educational Research Review*. 2012 Dec 1;7(3):198-215.
- [2] Wu J, Liu W. An empirical investigation of the critical factors affecting students' satisfaction in EFL blended learning. *Journal of Language Teaching & Research*. 2013 Jan 1;4(1).
- [3] Postigo RA, Bendayan R, Mena MJ. The Student Satisfaction with Educational Podcasts Questionnaire. *Escritos de psicologia*. 2017;10(2):126-33.
- [4] Zhu C. Student satisfaction, performance, and knowledge construction in online collaborative learning. *Journal of Educational Technology & Society*. 2012;15(1):127.
- [5] Tan TG, Lim TH, Goh CS. The relationship between students' satisfaction in using podcasts and their achievement. Retrieved from <https://www.researchgate.net/.../254864278>.
- [6] Evans C. The effectiveness of m-learning in the form of podcast revision lectures in higher education. *Computers & education*. 2008 Feb 1;50(2):491-8.
- [7] Middleton A. Beyond podcasting: creative approaches to designing educational audio. *ALT-J*. 2009 Jul 1;17(2):143-55.
- [8] Lee MJ, Chan A. Reducing the effects of isolation and promoting inclusivity for distance learners through podcasting. *Online Submission*. 2007 Jan;8(1):85-105.
- [9] Moore MG. Distance Education: A Learner's System. *Lifelong Learning*. 1989;12(8):8-11.
- [10] Kasse JP, Balunywa W. An assessment of e-learning utilization by a section of Ugandan universities: challenges, success factors and way forward. In *International conference on ICT for Africa 2013* (pp. 20-23).
- [11] International Telecommunication Union, (2017). ITU 15th World Telecommunication/ICT Indicators Symposium (WTIS). Switzerland: International Telecommunication Union. Retrieved from <http://www.itu.int/en/ITU/Statistics/Pages/events/wtis2017/default.aspx> On 10/2/2018.
- [12] Efuwape BM, Aremu A. Gender differences in acceptability and usability of computer-based learning package in electrical and electronics technology in Nigeria. *American Journal of Educational Research*. 2013;1(10):419-24.
- [13] Gefen D, Straub D. A practical guide to factorial validity using PLS-Graph: Tutorial and annotated example. *Communications of the Association for Information systems*. 2005 Jul 21;16(1):5.
- [14] Yukselturk E, Bulut S. Gender differences in self-regulated online learning environment. *Educational Technology & Society*. 2009 Jul 1;12(3):12-22.
- [15] Taylor L, Clark S. Educational design of short, audio-only podcasts: The teacher and student experience. *Australasian Journal of Educational Technology*. 2010 May 16;26(3).
- [16] Vogt M, Schaffner B, Ribar A, Chavez R. The impact of podcasting on the learning and satisfaction of undergraduate nursing students. *Nurse education in practice*. 2010 Jan 1;10(1):38-42.
- [17] Banerjee G. Blended environments: Learning effectiveness and student satisfaction at a small college in transition. *Journal of Asynchronous Learning Networks*. 2011 Feb;15(1):8-19.
- [18] Thomas S, Toland SH. Imitating podcasts by providing audio content to support and enhance language learning. *JALT CALL Journal*. 2015;11(1):3-17.
- [19] Lakhal S, Khechine H, Pascot D. Student behavioural intentions to use desktop video conferencing in a distance course: integration of autonomy to the UTAUT model. *Journal of Computing in Higher Education*. 2013 Aug 1;25(2):93-121.
- [20] Karim S, Islam MM. Use of Media in Open and Distance Learning: A Study of Their Use at Bangladesh Open University. Accessed from <http://digital.lib.ou.ac.lk/docs/bitstream/701300122/1189/1/Use%20of%20Media%20in%20Open%20and%20Dis>. On 11/2/2018.
- [21] Maag M. iPod, uPod? An emerging mobile learning tool in nursing education and students' satisfaction. In *Who's learning? Whose technology? Proceedings ASCILITE 2006* Dec 3 (pp. 483-492).
- [22] Faramarzi S, Bagheri A. Podcasting: Past Issues and Future Directions in Instructional Technology and Language Learning. *Journal of Applied Linguistics and Language Research*. 2015 May 11;2(4):207-21.
- [23] Torres JM. The use of podcasts in higher education: Communication, innovation, education and knowledge management. *International Journal of Educational Technology in Higher Education*. 2011 Jul 1;8(2):225-40.
- [24] Gorra A, Finlay J. Podcasting to support students using a business simulation. *Electronic Journal of e-Learning*. 2009;7(3):257-64.
- [25] Tam CO. The effectiveness of educational podcasts for teaching music and visual arts in higher education. *Research in Learning Technology*. 2012;20(1):n1.
- [26] Arulchelvan S, Viswanathan D. Role and Effectiveness of Electronic Media in Higher Education-With Special Reference to Tamilnadu. *Turkish Online Journal of Distance Education*. 2006;7(4).

- [27] Ting KY. Blended Learning as a Theoretical Framework for the Application of Podcasting. *English Language Teaching*. 2014;7(5):128-35.
- [28] Fietze S. Podcasting in Higher Education: Students' Usage Behaviour. *IIM*; 2010.
- [29] Chester A, Buntine A, Hammond K, Atkinson L. Podcasting in education: Student attitudes, behaviour and self-efficacy. *Journal of Educational Technology & Society*. 2011 Apr 1;14(2).
- [30] Oblinger D, Oblinger J. Is it age or IT: First steps toward understanding the net generation. *Educating the net generation*. 2005 Sep;2(1-2):20.
- [31] Richardson JC, Newby T. The role of students' cognitive engagement in online learning. *American Journal of Distance Education*. 2006 Mar 1;20(1):23-37.
- [32] Al-Asfour A. Examining student satisfaction of online statistics courses. *Journal of College Teaching & Learning (Online)*. 2012;9(1):33.
- [33] Li HC. Using podcasts for learning English: perceptions of Hong Kong Secondary 6 ESL students. *Début: the undergraduate journal of languages, linguistics and area studies*. 2010;1(2):78-90.
- [34] Chen RS, Tsai CC. Gender differences in Taiwan university students' attitudes toward web-based learning. *Cyberpsychology & behavior*. 2007 Oct 1;10(5):645-54.
- [35] Vázquez-Cano E, Meneses EL, García-Garzón E. Differences in basic digital competences between male and female university students of Social Sciences in Spain. *International Journal of Educational Technology in Higher Education*. 2017 Dec 1;14(1):27.
- [36] Murphy A, Farley H, Lane M, Hafeez-Baig A, Carter B. Mobile learning anytime, anywhere: what are our students doing?. *Australasian Journal of Information Systems*. 2014 Nov 1;18(3).
- [37] Hartenberger L, Bosch A. Making Interactive Radio Instruction Even Better for Girls: the data, the scripts, and the potential. *Education Development Center*; 1996.
- [38] Prensky M. Digital natives, digital immigrants part 1. *On the horizon*. 2001 Sep 1;9(5):1-6.
- [39] Freedom on the Net Report 2017. From <https://freedomhouse.org/report/freedom-net/2016/uganda/>. Retrieved 23/12/2017.
- [40] Kumar R. Convergence of ICT and Education. *World Academy of Science, Engineering and Technology* 40 2008. Retrieved on November 25 2011.