Multimedia Technologies for Business Education Augmentation in Higher Learning Institutions

A Study Conducted at University of Dar es Salamm Business School

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Abstract— **Multimedia technologies play an imperative role in augmenting education delivery in higher learning institutions globally. Higher learning institutions providing business education experience several challenges in ensuring that their graduate students have necessary skills enabling them to become successful business professionals in the current highly competitive multimedia dependent business era. Lack of enough skills and understanding on how to exploit the benefits and power of multimedia technologies to run their business activities is one of the major challenges experienced by these graduates.**

Recently, these institutions have recognized the importance of ensuring that information technology has to be aligned with business by making some information technology courses as core courses for business students to undertake. However, multimedia technology courses which are currently essential aspects for which business development depends on have not yet being made major courses for business students to undertake by most higher learning institutions in Tanzania.

Based on the study conducted at the University of Dar es Salaam Business School, it was found out that the school has not yet taken a very important and needed decision of making sure that business studies are being taught together with essential multimedia technologies courses due to several challenges which have been explored in this study. This study aims to provide a very solid foundation for making business graduates ready to compete successfully in the current multimedia dependent business environment. This is due to the fact that running and managing recent business activities such as advertisements, communication, marketing and the like depend much on multimedia technologies support.

This study explores the challenges, approaches and recommends appropriate solutions that can be adopted to augment business education delivery in higher learning institutions. The findings of this study indicate that effective incorporation of multimedia technologies courses in business studies in higher learning institutions is fundamental in augmenting business education delivery in these institutions since it helps in equipping business graduates with essential skills needed to run and manage their business activities successfully.

Keywords- Multimedia Technology, ICT, Multimedia courses, Business Courses, Evaluation Rubric Dimensions.

I. INTRODUCTION

Competition in the current worldwide business environment is compelling business professionals to look for various methods to run their business activities much more successful. This situation has rapidly increased interest in application of information and communication technology (ICT) in business.

Multimedia; being an important and recent technology growth in ICT, is currently capturing the interest of business as far as business efficiency, running costs, advertisements, presentations, training, customers' care and new competitive products are concerned. Essentially, multimedia involves the blending of images, graphics, sound, voice, videotext and tubular information within a human interface that uses capabilities to access and present information.

Globally, higher learning institutions have the responsibility of preparing and producing well skilled graduates for working in various development sectors including business sectors where successful business professional can be obtained. With the current demand in the use of multimedia technologies for business development; these institutions specifically those offering business education need to include some key multimedia technology courses among core courses offered to students undertaking business studies.

In Tanzania, most higher learning institutions still offer only basic computer applications courses to business students without taking into consideration the need for equipping business students with multimedia technology expertise in making them competitive and highly skilled business professionals ready for competing in recent highly competitive multimedia dependent business environment.

This study investigates various means, techniques and tools used to provide business education at the University of Dar es Salaam Business School (UDBS) which is one of the

most successful business schools of the University of Dar es Salaam in Tanzania offering business education.

UDBS experience challenges on how to equip business students with necessary skills which can enable them to either be successful employees or successful employers if they opt to self employ themselves after graduating.

Challenges like lack of high skilled multimedia instructors, lack of well equipped multimedia technologies laboratories, failure to include some key multimedia technologies courses as core courses for business students to undertake and lack of knowledge on the fact that current business can not run successfully without multimedia technology support are among major challenges faced by UDBS.

Furthermore, multimedia technology needs for business development in recent years has even altered the world leading computer manufacturing industries to include more multimedia support capabilities in new produced computers. With the major attraction and selling point of computers these days being the inclusion of multimedia facilities and capabilities, then multimedia technology can never be left aside in today's worldwide business environment and thus inclusion of multimedia technology courses as major courses for business students in higher learning institutions to undertake is inevitable [1][2].

This study investigates such challenges and recommends appropriate solutions which can be adopted to successful augment business education provided at UDBS thereby enabling the school to produce highly skilled, competitive and successful business professionals. This was successfully done by first analyzing various techniques, means and tools used to offer business education at UDBS and then based on a multimedia technology business education delivery model proposed following this study, the author was evidently convinced that inclusion of multimedia technology courses is imperative for business education augmentation in higher learning institutions specifically those offering business education.

II. LITERATURE REVIEW

The author in this part provides a review of application of multimedia technologies in various business areas. With the purpose of this review being to establish key factors as to why multimedia technologies are essential in business development and why there is a need to include multimedia technologies courses among core courses undertaken by business students in higher learning institutions.

It is obvious that currently the demand for multimedia technologies application is increasing rapidly in various areas raising the need for equipping business students with multimedia technologies skills enabling them to be successful future business professionals.

A. Multimedia Technologies in Banking and Finance

Banking and financial industries are heavy users of IT and telecommunication services, with almost every business transaction leading immediately to a computer assisted process. Major Banks operating globally would be unable to conduct business without efficient telecommunication networks and IT to serve their customers.

The European Union Research and development in Advanced Communications Technologies for Europe (EURAC) programs which have been contributing and continue to contribute to worldwide developments in audio visual services, played a key role in developing the crucial technology of Asynchronous Transfer Mode (ATM). In the context of mobile and personal communications, the EURAC program aimed at the development and validation of the necessary key technologies and concepts of mobile and personal communications that would in the future constitute the building blocks of the third generation mobile communication systems.

As part of the commercial bank application of the EURAC program, an international consortium looked at how self-service banking and advisory support applications for up-to-the minute analyses of bank products can be used to better serve customers in the future [3]. Similarly, a ÔRACEÕ collaborative project that brought together these key technologies to develop a multimedia terminal for the finance sector was then used by the banking partners to obtain a first hand insight to the practical benefits this application brings [4].

B. Multimedia Technologies in Entertainment

In entertainment, the VIDEO CD is the combined specification among CD format, MPEG video/audio compression and Multiplex technology. It started from the KARAOKE CD format that was developed for the linear motion picture and sound aimed to business use. To it has been added high resolution still picture and playback control features for wider application requiring simple interactivity.

Therefore, it can be used for not only linear program play but also for multimedia package programs. It is the opening to the new era of digital video/sound for the consumer market [5].

The advances in storage, host I/O, and networks enable a variety of on-demand services. To it effectively use these resources, proposed a Scalable and Extensible Architecture for Multimedia Entertainment (SESAME) to explore the modularity and scalability of Karaoke on demand (KOD) service. The SESAME approach is being extended to some other areas of interest such as distance learning [6].

C. Multimedia Technologies in Health Care

The business of healthcare management is changing and moving in the direction of managed care, capitation, and integrated delivery systems. Information management is crucial to the success and competitiveness of these new care delivery systems. A major goal of medical systems designers

is to develop a model for a multimedia, computer-based patient medical record (CPR).

A logically integrated distributed multimedia patient data system gives authorized physicians' transparent access through a single workstation. In conjunction with this integration, it provides asynchronous desktop conferencing between physicians connected by ATM and ISDN wide-area networks [7][8].

D. Multimedia Technologies in Construction and Transportation

The Information Super Highway has received great attention recently. Emerging and information technologies such as internet, 3D animation, multimedia, voice recognition, digital photography, and others promise to transform how western industry conducts business. The technology faces challenges of transfer to appropriate application areas and integration for information optimization.

To investigate the broad ranging questions of transfer and integration, the Construction Information Technology (CIT 21) project was conceived. The CIT 21 project is an effort to develop simulated 21st century construction organizations. The project's focus is the investigation of emerging and information technologies impact on communication, productivity, and processes at the project level.

The usage of computer technologies has revolutionized the practice of structural engineering during the past 30 years. The arrival of multimedia technologies within computer hardware and software will continue this trend. However, unlike previous computerization in engineering which focused on the analysis and design of complex structures, multimedia will also be useful for many other business applications beyond analysis and design [9][10].

Multimedia can be used in the design and construction of a building including safety management in construction work, project management, computer-aided design and construction, and the inspection reporting system for the construction industry. The multimedia applications such as video conferencing, shared-screen computing and remote multimedia links on construction projects could have a significant impact on inter-professional communications and informal exchanges of information [11][12].

E. Multimedia Technologies inPrinting and Publication

The most common and simplest form of multimedia used by organizations is the World Wide Web (WWW). Fundamentally, there are three key processes that need to be undertaken in creating multi-media hypertext pages for the World Wide Web (WWW). These include: creating an electronic document, the syntax of Hypertext Markup Language (HTML) linking text, images, and sound and the communication and business issues involved in Web publishing [13].

More sophisticated ways of publishing to wider audiences are now being developed. A publisher of business and financial news and a regional telephone service provider are developing the means to produce, distribute, and retrieve multimedia news over wideband information networks. The goal is to deliver business news on demand to corporate and financial professionals in near real time using advanced network-based multimedia services.

F. Proposed Business and Multimedia Technology Education Delivery Model in Higher Learning Institutions

The model proposed in this study is important for enabling business graduates to effectively deal with the challenges in today's multimedia dependent business environment. The model provides business graduates with strong foundation of not only how to make their business successful but also make them clearly understand how to combine both; business techniques with multimedia technologies to overcome the current and future business challenges [14][15].

Since this model aims at setting up a strong foundation for making business graduates successful future business professionals then it involves all important parties where business students can interact and gain professional experience [16]. The model provides an effective method for making business graduates well eqquipped with both business and multimedia techniques experiences needed in the recent multimedia dependent business environment. Figure 1 illustrates the model as it was applied in this study.
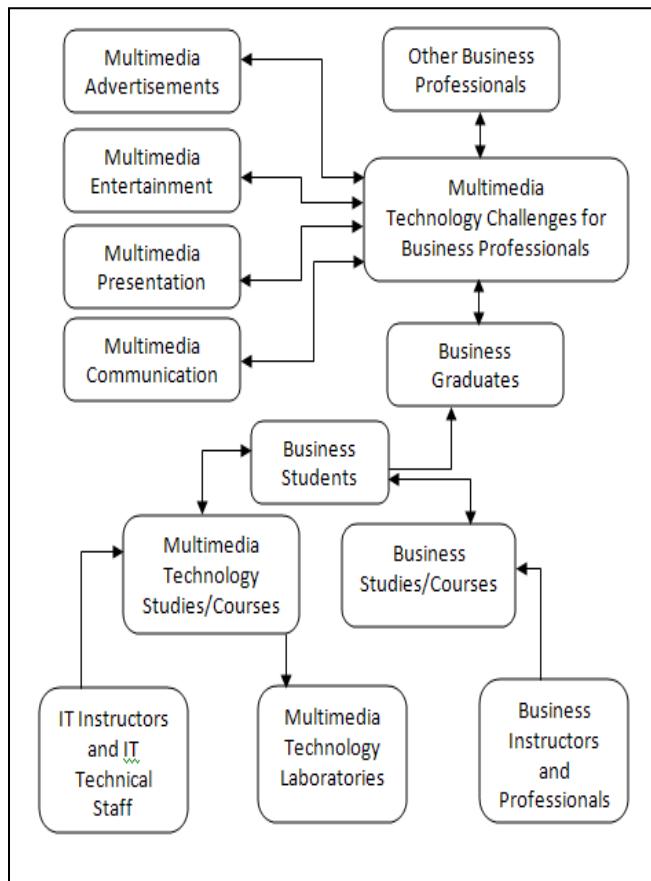
Figure 1. Business and Multimedia Technology Education Delivery Model

III. METHODOLOGY

A. Study Design

The design of this study involved the analysis of various means and techniques used in delivering information technology courses to business students. With this, the author had to use personal observation, interviews and other techniques such as comparative analysis and cause and effect analysis strategy to effectively investigate the benefits and challenges which could be faced by UDBS students in undertaking multimedia technologies courses.

Mixed research methods; qualitative and quantitative research methods as recommended in computing field were employed. These methods helped to increase the results generalizability while providing strong evidence for reaching the conclusions and recommendations through convergence and collaboration of the study results.

The author was also aided by a business and multimedia technology education delivery model involving institutions instructors, students and technical staff for effective delivery of business and multimedia technology courses in higher learning institutions as illustrated in figure 1. The model also indicates how business graduates face several challenges in the current multimedia dependent business era. However, with effective implementation of this proposed model; business graduates will be well equipped to successfully overcome such challenges.

The sample of the participants included UDBS students, instructors and ICT technical staff members. The target of the study was to get 130 participants (100 students, 20 instructors (both ICT and business instructors) and 10 ICT technical staff members for both data collection and evaluation. During evaluation, stratified sampling technique was applied.

Two departments; ICT and business departments from UDBS and computers science department as an ICT department of the University of Dar es Salaam (UDSM) were sampled as categories or strata to ensure that greater precision is guaranteed. 100 students were selected from the business department stratum and 10 instructors were selected from each stratum (i.e. from ICT and business departments). Also 10 ICT technical staff members were selected from ICT department stratum.

In defining the sampling frame, the following departments from UDSM were used as strata; computer science department as an ICT department and business department from UDBS.

Though this technique required sufficient time but it sufficiently aided in attaining the precision needed and it was effective and suitable for this research study. The results obtained were both largely unbiased and accurate because it produced data that was more representative of the targeted population since it provided special attention to the smaller categories or strata within the population.

In order to get most accurate results, the author ensured that no population element was excluded during stratification.

B. Evaluation Methods

During evaluation of participants' opinions with the benefits and challenges of multimedia technology courses to business education delivery in higher learning institutions and its importance for equipping business students with essential skills which can make them successful in the recent highly competitive business environment; face to face interviews as well as evaluation forms were used to obtain their views.

The author had to first conduct a face to face interview on multimedia technologies, systems and applications with participants before giving them the evaluation forms for them to complete. The filled evaluation forms were then returned to the author for analysis.

The author had also to test whether the evaluation criteria evaluated in this study for the case of different categories of

participants were correctly evaluated as far as information systems research studies are concerned [17]. During this process, the reliability analysis was done where three evaluation criteria were involved with four items for each criterion being evaluated. In order to test the reliability, the cronbach alpha factor was determined.

IV. RESULTS AND DISCUSSION

The results were grouped into two main groups. Firstly, results from analysis of mostly used means and techniques in delivering business and ICT courses to business students at UDBS. Secondly, results from evaluation of participants' observations and comments on the importance of making essential multimedia courses as core courses for business students to undertake in higher learning institutions.

A. Results From Analysis of used Means and Techniques in business and ICT courses delivery at UDBS

Table I summarizes business and ICT courses delivery challenges and recommendations for overcoming those challenges as far as the recent highly competitive multimedia dependent business environment is concerned.

TABLE I. BUSINESS AND ICT COURSES DELIVERY STATUS AND RECOMMENDTIONS AT UDBS

Taught Courses	Capability of Knowledge provided in enhancing business development	Causes and effects of the challenges based on taught courses	Improvements required to enable business graduates to be successful in the recent competitive multimedia dependent business era
Business Courses	-Acceptable and provides enough business knowledge to students.	-Still no enough meetings, conferences or seminars between business students and other business professional for making students easily understand business challenges and how to practically overcome them.	-Need more meetings, conferences and seminars between business students and business professional. -Institutions need to prepare these meetings, conferences and seminars at least twice per each semester especially for final year business students. -Keeping in touch with business graduates i.e. business alumni could be key in making these occasions possible. -More education on the importance of these meetings, conferences and seminars should be provided to business students as they are future business professionals. -institutions could as well organize and plan how to obtain business

Taught Courses	Capability of Knowledge provided in enhancing business development	Causes and effects of the challenges based on taught courses	Improvements required to enable business graduates to be successful in the recent competitive multimedia dependent business era
			alumni financial and professional contributions in making such events possible and be part of key requirement to business students before they graduate.
ICT Courses such as: -Basic computer applications i.e. how to use basic computer programs like Ms Word, Ms Excel	-Does not provide basic skills which enable business graduates to successfully fit in current highly competitive multimedia dependent business era.	-Though basic computer applications courses are taught but still no enough practical exercises are provided. -Still no multimedia courses taught to business students due to challenges such as: -Lack of enough multimedia technologies instructors. -lack of multimedia laboratories. -Lack of enough knowledge on the importance of multimedia technologies in recent business era.	-Institutions should invest much on preparing well equipped multimedia laboratories. -More multimedia instructors have to be employed or if possible some academic staff members have to be sponsored to go for further multimedia courses such as Masters and PhD in Multimedia Technologies. -Investment on multimedia technical staff is also essential in simplifying practical sessions, so more technical staff members have to be sponsored to go for further technical short courses on multimedia technologies.

B. Evaluation Results

After the author's investigation on the challenges facing business professionals and after studying various techniques and means used at UDBS to provide business education to business students; the author required to have an understanding of participants views on the extent or capability by which inclusion of multimedia technologies courses among core courses for business students can help to make business graduates more competitive in the current highly competitive multimedia dependent business environment.

From 130 participants targeted by this study, the author was able to get the evaluation results from 115 participants (95 students, 13 instructors (both ICT and business instructors) and 7 ICT technical staff members). Below are the results of the participants' views on multimedia technology courses capability to enhance business development.

TABLE II.   STUDENTS VIEWS ON MULTIMEDIA TECHNOLOGY COURSES TO ENHANCE BUSINESS DEVELOPMENT

	Multimedia communication and Presentations Design	Multimedia Advertisements' Design	Multimedia Business Applications Design and Evaluation	Multimedia Laboratories
High	77	72	68	78
Average	12	15	16	10
Low	6	8	11	7
Total	95	95	95	95

Number of Cases (Evaluation Rubric Dimensions) = 3.0
Number of items evaluated = 4
Cronbach alpha = 0.9968

Table II illustrates the evaluation results from business students based on four key criteria used to investigate their views on the capability of multimedia courses to enhance business development.

When required to provide their views on the importance of equipping business students with skills in multimedia communication and presentations design techniques, 81 percent considered the skills to be highly essential in the current business era while on 6 percent did not recognize the skills potentiality in enhancing business development.

When required to provide their views on the need to equip business students with multimedia design and/or evaluation skills on multimedia advertisements and applications; about 74 percent of students considered the skills to be highly important while only 10 percent could not realize the skills importance in business development.

Based on multimedia laboratories importance to simplify students understanding and grasping of essential multimedia technologies skills for business development; 82 percent of students considered the use of such laboratories to be vital in making business students easily understand the needed skills while only 7 percent of them could not realize their importance.

TABLE III.   BUSINESS AND ICT INSTRUCTORS VIEWS ON MULTIMEDIA TECHNOLOGY COURSES TO ENHANCE BUSINESS DEVELOPMENT

	Multimedia communication and Presentations Design	Multimedia Advertisements' Design	Multimedia Business Applications Design and Evaluation	Multimedia Laboratories
High	9	11	10	10
Average	3	2	2	2
Low	1	0	1	1
Total	13	13	13	13

Number of Cases (Evaluation Rubric Dimensions) = 3.0
Number of items evaluated = 4
Cronbach alpha = 0.9860

Table III above illustrates the evaluation results from UDBS business and ICT instructors based on four key criteria used to investigate their views on the capability of multimedia courses to enhance business development. Based on the importance of providing business students with multimedia communication and presentations design skills and techniques; 69 percent of instructors involved in this study considered the skills to be highly essential in the current business era while only 7 percent did not recognize the skills importance in enhancing business development.

When required to provide their views on the need to equip business students with multimedia design and/or evaluation skills on multimedia advertisements and applications; about 80 percent of instructors considered the skills to be very important as far as the recent business environment is concerned while only 4 percent could not realize the skills importance in business development. .

Based on multimedia laboratories importance to simplify students understanding of essential multimedia technologies skills for business development; 77 percent of instructor considered the use of such laboratories to be very essential in making business students easily understand the needed skills while only 7 percent of them could not realize their importance.

TABLE IV.   ICT TECHNICAL STAFF MEMBERS VIEWS ON MULTIMEDIA
TECHNOLOGY COURSES TO ENHANCE BUSINESS
DEVELOPMENT

	Multimedia communication and Presentations Design	Multimedia Advertisements' Design	Multimedia Business Applications Design and Evaluation	Multimedia Laboratories
High	5	6	6	7
Average	2	1	1	0
Low	0	0	0	0
Total	7	7	7	7

Number of Cases (Evaluation Rubric Dimensions) = 3.0
Number of items evaluated = 4
Cronbach alpha=0.9839

The table above illustrates the evaluation results from ICT technical staff members involved in this study based on four key criteria used to investigate their views on the capability of multimedia courses to enhance business development.

On the importance of providing business students with multimedia presentations design skills and techniques criterion; 71 percent of ICT technical staff involved in this study considered the skills to be highly important in the current business era while none of them could not recognize the skills importance in business development.

When required to provide their views on the need to equip business students with multimedia design and/or evaluation skills on multimedia advertisements and applications; 86 percent of ICT technical staff considered the skills to be very important in the current business environment.

Based on multimedia laboratories importance to simplify students understanding and grasping of essential multimedia technologies skills for business development; 100 percent of ICT technical staff considered the use of such laboratories to be very essential in making business students easily understand the needed skills.

C.   Participants Satisfacation

In order to test the participants' satisfaction with the inclusion of multimedia courses among core courses for business students to undertake, three evaluation criteria as illustrated in part B above were used with four items being evaluated. Depending on each evaluation criterion, the reliability analysis test based on Cronbach alpha model was performed.

For the three evaluation criteria evaluated and based on students, UDBS business instructors and ICT technical staff views on multimedia technology courses capability to

enhance business development, the reported values of cronbach alpha of greater than 0.9 were obtained indicating good reliability and thus the three criteria were correctly evaluated in this study. With the fact that there is no definitive standard for reliability, cronbach alpha values of 0.7 or above are normally considered to be acceptable in most information systems research situations [17].

*D.   Business and Multimedia Technology Education
Delivery Model Capability for Business Development
and Management*

Business graduates from UDSM have been facing several challenges to cope with the rapid changes in the business environment. However, recent changes in the business environment due to the increase in competition from various business sectors especially as a result of the application of multimedia technologies in many of those sectors have made business activities done by most of the business graduates much more complicated.

In recent years, UDBS business graduates have been trying to find out the possibilities of self employing themselves due to the rapid decrease in the number of employment opportunities in various organizations and institutions. However, the lack of enough skills on how to combine business and multimedia technologies strengths to make their business establishments much more competitive and profitable is a very big challenge they face.

That being the case, there is a need to make sure that business graduate are effectively equipped with essential techniques and skills which will make them successfully fit in both; employment and self employment business environments.

This study has come out with an education model that combines business and multimedia technologies courses for being undertaken by business students in higher learning institutions as soon as they begin their business studies aiming at one day becoming successful future business professionals.

The model proposed in this study has been well researched and found to be fundamental for preparing very competititve and successful future business professionals with the capability of coping with the current and future highly competitive multimedia dependent business environments.

CONCLUSIONS

The current highly competitive business environment compels high learning institutions to prepare and produce business graduates with essential skills required to make them become successful business professionals. This demand can not be made possible if business students are not well equipped with essential multimedia technologies techniques, skills and experience.

This research study has investigated different means, techniques and strategies used at UDBS to provide business education to business students. The study findings reveals that UDBS needs to augment its methods of providing business education by making essential multimedia technologies courses core for business students to undertake.

Furthermore, the author has clearly analyzed various means and techniques used at UDBS as summarized in table I in delivering business and ICT courses where he has gone further to explore the challenges UDBS suffers from those used means and techniques and finally recommended appropriate measures to be undertaken to overcome those challenges.

This paper contributes to existing literature on multimedia technologies for business education augmentation in higher learning institutions specifically those institutions offering business education. The study has provided a business multimedia courses delivery model which can be used to guide higher learning institutions offering business education on proper methods and techniques for delivering business education to business students as far as the recent highly competitive business environment is concerned [16].

From a practical standpoint, this study may help decision makers, business and ICT instructors in higher learning institutions on the importance of setting up multimedia laboratories for being used by business students as well as the essential need for organizing and setting up professional business conferences, meetings and seminars between business students and business professionals working in various business organizations. This will help to provide business students with essential skills; techniques and experience they need to become successful future business professionals as far as the recent multimedia dependent business era is concerned.

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