DEVELOPMENT OF AN INFORMATION & COMMUNICATION TECHNOLOGY (ICT) BUSINESS MODEL FOR ELECTRONIC LEARNING (E-LEARNING)

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Abstract

The e-learning industry has been realized as a solution to high demand for tertiary education and population growth in developing countries. Lack of facilities such as lecturer rooms, halls of residence and the high cost of building new facilities have made E-Learning an attractive alternative. Although in University of Cape Coast (UCC) Ghana, there exists a system already in place, users and stakeholders are disenchanted with it due to the fact that the kinds of education being offered is currently traditional learning and distance learning (off-campus education) which is not as advantageous as e-learning. Currently there is no use of ICT-based tools or facilities for teaching and learning (e-learning). Through SWOT analysis, qualitative and design research methodologies, this paper focuses on the development of an ICT E-learning business model framework for UCC in order to enhance sustainability and profitability of a proposed E-Learning system.

Index Terms: *Education, ICT, E-Learning, Business Model, Distance Learning, UCC, CCE*
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1. INTRODUCTION

According to Hoppe and Brietner (2003) [1], the importance of E-Learning cannot be over emphasized. The paramount importance of knowledge, life-time learning/lifelong learning, globalization and mobility has made it so. Not all providers of E-Learning products succeed in closing the gap between production costs and revenues. In the academic sector, E-Learning projects suffer more and more because of decreasing funding, especially in developing countries where funding even for traditional classroom learning has been decreasing over the years. The basis of a successful commercialization of E-Learning products is a coherent and consistent overall E-Learning strategy. E-Learning strategies have to address economical, pedagogical and technological goals. For ensuring pedagogical and technological quality, there are different theories and models ensuring economical "quality" in terms of marketable and sustainable products. Some providers of E-Learning components realize profits by offering E-Learning products. They are likely to become key players of E-Learning. Successful E-Learning products are subject to a lot of different research projects. Some of these projects also result in theoretically marketable E-Learning products. Especially in the academic sector, many E-Learning research projects benefit from governmental grants and subsidies. Today, for many active research groups it is essential to market their results in order to fund actual and future E-Learning projects. A suitable business model is crucial to put their work on a commercially exploitable basis. The business model is part of a comprehensive E-Learning strategy and this paper focuses on the development of an ICT E-learning business model framework for UCC in order to enhance sustainability and profitability of a proposed E-Learning system.

1.1. Brief Background and History of the University of Cape Coast (UCC)

The University of Cape Coast (UCC) is one of the rare sea front universities in the world. It was established in October, 1962 as a University College and placed in a special relationship with the University of Ghana, Legon. On October 1, 1971, the College attained the status of a full and independent University, with the authority to confer its own degrees, diplomas and certificates by an Act of Parliament - The University of Cape Coast Act, 1971 [Act 390] and subsequently the University of Cape Coast Law, 1992 [PNDC Law 278]. Since its establishment, UCC has provided quality tertiary education at different levels in different areas such as Physical Sciences, Business, and Humanities etc. to both Ghanaians and non Ghanaians [2].

NANA YAW ASABERE* et al.   ISSN: 2250–3676

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1.2. Relevance of Business Models in E-Learning

In the last few years, the concept of business models has become popular, especially since the collapse of the new economic hype or the credit crunch. Research into business models has attracted even more attention in both academia and industry. When designing a new business, the kind of model it uses is likely to be a critical factor in its success. E-Learning investments can be viewed as strategic investments of academic institutions that aim to achieve competitive advantage, both in terms of effectiveness and cost structures. The underfunding of public universities in Ghana such as UCC has triggered discussions about new sources of revenue to run the universities. However, implementing E-Learning solely due to economic motivations, may likely lead to the failure of the system. E-Learning has been identified as a growing market as a result of the increasing demand for higher education and training [3]. Timmers (1998) [4] defines a business model as "architecture of products, services, and information flows including a description of the various business actors and their roles; and a description of the potential benefits for the various business actors; and a description of the sources of revenue". Four categories of business models (content, commerce, context, connection) are applicable for the internet. Furthermore, they distinguish between direct and indirect as well as transaction-dependent and transaction independent revenue generation. Designing business models is a very complex undertaking because of the interrelatedness of the different blueprints. Different requirements (user, technical, organizational and financial requirements) need to be accommodated and balanced. Design choices in one domain (e.g. technical domain) may affect those of other domains (e.g. user domain). This interrelatedness of design choices complicates the design of viable business models for E-Learning.

2. OVERVIEW OF THE UCC's EXISTING SYSTEM

The University of Cape Coast has a division called the Centre for Continuing Education (CCE) which is in charge of distance education. The Centre is an affiliated member of the West Africa Distance Education Association (WADEA). The Centre is a sub vented sector of the Ministry of Education [5]. The Centre was established, primarily to:

- Provide opportunities for people to pursue higher education.
- Train more professional teachers for all levels of education in the Ghana Education Service (GES).
- Train higher calibre personnel for national development.

- Raise the professional competence of serving teachers and personnel of the Ghana Education Service, as well as accounting and secretarial personnel in civil/public service, commerce and industry through Continuing Education.
- Provide opportunities for applicants who, even though qualify for admission, fail to enter the University due to constraints in physical facilities.

Though the Centre's focus is currently directed at [5]:

- Mounting distance education programme in Basic Education leading to the award of Diploma, Degree and Master's Degree.
- Mounting all the viable academic programmes in the University especially Bachelor of Commerce (B. Com) and Bachelor of Management Studies on distance.
- Using the multi-media mode of delivery for its distance education – print, audio cassettes, video cassettes, radio broadcasts, television, etc.

Some of these focuses have not been achieved.

2.1 Study Centres (Distance Education Centres) of the CCE

CCE has centres in all the regional capitals and some district capitals in the country. It currently has 33 study centres nationwide. These form a major component of the administrative structure of the programme. The centre is headed by a director, who has tutors under him who report to him. At the regional centres, there are regional resident tutors. In regions where there are no resident tutors, there are co-coordinators who facilitate the smooth running of programmes. The main function of the study centres is to serve as avenues for interaction with staff and students, tutoring and counseling; providing physical facilities such as classrooms, laboratories and libraries for assisting students and organizing lectures; discussion groups, workshops and seminars. Details of the CCE's study centres in the regional capitals can be found in table 1 below.

Table-1: Regional Study Centres of CCE-UCC in Ghana

REGION	STUDY CENTRE	CENTRE CODE
Ashanti	Kumasi Polytechnic	001
Brong Ahafo	Sunyani Polytechnic	002
Central	University of Cape Coast	003
Eastern	Koforidua Polytechnic	004
Greater Accra	Zenith College	005
Northern	Tamale Polytechnic	006
Upper East	Bolgatanga Polytechnic	007
Upper West	Wa Secondary School	008
Volta	Ho Polytechnic	009
Western	Takoradi Polytechnic	010

3. RESEARCH OBJECTIVES

The main objectives of this research paper are to:

- Analyse which business model(s) that can be used to make the institution (UCC) self sufficient when E-Learning is implemented.
- Develop an ICT business model to:
- ➢ Maximize revenue generation from E-Learning.
- ➢ Minimize cost of core processing or transaction costs such as utility costs, etc.

4. RESEARCH METHODOLOGY

The analytical and methodological basis for this study was drawn from empirical literature about E-Learning, business models in general and ICT business models. This research was based on exploratory research**.** Interviews that lasted a maximum of one (1) hour were conducted with the one (1) administrative official and four (4) teaching staff members of the CCE to solicit information regarding the existing system of CCE, current prospects of e-learning at UCC and current challenges and problems of CCE.

4.1 Summarization of Interview Responses Collected

Attitudes to E-Learning were mixed, from the highly supportive to the highly skeptical. It could be seen that there was a widespread lack of awareness of the potential and quality E-Learning can achieve in UCC. There was a strong allegiance towards the face-to-face model of teaching allied with skepticism about E-Learning, particularly about issues of workload, quality and loss of control. There was however evidence of enthusiasm and strong expertise among some staff, with recognition of the need for new approaches. Support was also received from some administrative sections who understood the requirements to support E-Learning. There was however some concerns raised by a section of academic staff that central services will not be receptive to the needs for support required by academics adopting E-Learning. Some considered that with government trying to shift its financial responsibilities in the tertiary sector onto parents or guardians, who will not be willing to invest in the implementation of an E-Learning system

5. CURRENT PROBLEMS AND CHALLENGES OF CCE

From the interview conducted, we realized that the major challenge that CCE faces currently, has to do with getting places to use as study centres. Sometimes CCE/UCC is forced to look for new study centres within a very short time period. Currently the centre is in the process of looking for a new regional study centre for the eastern region, since it has been told by the Koforidua Polytechnic authorities that they can no longer use their premises. To overcome such a challenge, the centre has begun buying plots of lands in the various regions so as to build their own study centres. Students complain that important information is not disseminated to them on time. Students have to sometimes arrange seating positions or index numbers before examinations can take place. Some invigilators have also been accused by students of talking to them harshly.

6. IMPORTANCE OF E-LEARNING TO CCE OF UCC

Enormous pressures have been placed on the distance education sector to move beyond the traditional correspondence modes and embrace an expanding E-Learning environment due to advances in educational technologies. It has been cited by [5] that the sector would not remain viable without change, particularly within the context of an increasingly competitive global distance education market. Currently the Centre for Continuing Education does not implement E-Learning, but it hopes to do so, in the not distant future, as plans are being put in place. E-Learning is important for economic development, both for individuals and the country Ghana. Today's economy relies on a labour force that not only possesses the necessary training, but can continue to learn. Therefore as jobs evolve in response to the changing economy, workers need to learn new skills, and this retooling occurs throughout their lives. In this way the University of Cape Coast can use E-Learning as a technological response to the society's need for lifelong rapid learning. By adopting E-Learning the Centre of Continuing Education of the University of Cape Coast can benefit in various ways such as:

A. **E-Learning -** means that students no longer need to spend time travelling after work to a centre to attend a course; they can now have access to learning when they want it, the time they want it (day or night), wherever they want it - at home, at work, in your local library. For many students this would open up a new, much more flexible and accessible world of learning that was previously closed to them due to disability or family circumstances, or perhaps due to the fact that the university has not got the physical facilities to admit and accommodate on its campus. In other words, there are now no longer any geographical constraints to learning; E-Learning brings learning to people, not people to learning.

B. **E-Learning** would make learning exciting, engaging and compelling. Hard and boring subjects can now be made easier, more interesting and appealing with E-Learning. So, for example, videos and documentaries of various courses or subjects which will give a better understanding to students can be displayed or shown through the E-Learning system or a videoconferencing centre.

NANA YAW ASABERE* et al.   ISSN: 2250–3676

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7.CONSENSUS BUILDING OF THE INSTITUTION (UCC)

In implementing an E-Learning Proposed System, it must be noted that the E-Learning system being proposed would not be the responsibility of only academics of UCC, but everyone including the Library, Registry, Computer Centre, Examinations Unit, Students Records and Management Information Section, Finance, Human Resource etc. For the E-Learning system to do well all these units and sections must interact to ensure that there are no blockages or inhibitors. The political support of senior management of both the university and the Centre of Continuing Education was sort through interviews, since it is essential for the adoption of new practices. All interviews lasted between 15 and 30 minutes. Academic staffs of the Centre were also consulted and their views sort, since staff acceptance and engagement is a key factor in the successful implementation of the E-Learning system. Also new innovations cannot be adopted without buying in from the rank and file of the academic staff in their role as course tutors. This also helped to establish the conditions likely to favour embedding.

8. BARRIERS TO E-LEARNING IN UCC

Funding and competing agendas of the government and the university are some of the threats or potential barriers to the implementation of E-Learning in the University of Cape Coast. It was also discovered that, over one sixth of academic staff taught classes with average populations of over 160. In effect, there should be some incentives for individual academic staff to take on more/additional students.

9. KEY FACTORS FOR BUILDING A SUCCESSFUL BUSINESS MODEL

Having a business model that becomes successful does not just come by chance, there has to be certain factors in place. According to [6] cited by [7], there are six critical factors to build a good business model and these are:

i.   To attract high value customers without a lot of cost.
ii.   To offer as much value as possible to customers in order to have significant competitive advantages.
iii.   To deliver products/services with high margins by assuring high quality and minimize waste.
iv.   To meet and exceed customers' expectation, satisfy customers by service and training if needed.
v.   To secure and maintain the market position in order to stabilize the existing products/service and develop new products/services in a sustainable way.

vi.   To balance the business funding by reasonable investments (based on market size) and risk management for both start-up costs and market maintenance.

For the first factor, [6] stated that high value customers do not necessarily need to be rich customers but they should:

a.   Be easy to locate.
b.   Be willing to pay a profitable price for products/services.
c.   Be willing to try products/services after limited marketing expenses.
d.   Be able to generate enough business to meet the sales and profit objectives.

How to create value for the customer becomes the key for the second factor. Besides maintaining competitive advantage to customers (students), there are a number of other ways to create value for customers:

1.   Lower price by increasing manufacturing efficiencies and optimizing pricing options.
2.   Optimize logistics through distribution.
3.   Provide customized and personalized products/services.
4.   Offer various products/services and more options for customers (students).
5.   Co-operate through partnership or alliances with other companies (universities) in order to provide better and complete customer (student) solutions.
6.   Embed unique features and benefits in products/services.

In connection with the third factor above, the key is to find how to make products/services in a cost-effective way. Products/services made from an improved process guaranteeing high quality and low waste are what produce high margins. More precisely high margins can be achieved by:
●   Having a leaning and quality-oriented manufacturing process.
●   Optimizing distribution channels.
●   Having more value added auxiliary products/services or other opportunities to increase revenue without increasing sales cost.

High margins which mean high profits are the concern of most businesses. However, most business models and business plans spend little time on delivering high margin products/services even though it is a key for a successful business model. This has been seen to be obviously wrong because most value comes out of the ability to achieve high margins.

NANA YAW ASABERE* et al.   ISSN: 2250–3676

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Customer satisfaction which is the fourth factor is always critical to the success of the business. The ideal model is to use few resources to create value for customers and maintain customer satisfaction; and in turn improves a firm's market position as well as adds value to a firm. Some clues are as follows:

- Easy installation by introducing user-friendly interface.
- Good technical support for extensive customer (students') services.
- Easy interfacing to other similar products/equipments.

Usually, the customer satisfaction cost occurs after the service. To maintain customer satisfaction in an ideal way involves value adding to customers. The failure to maintain customer satisfaction does not only mean reduced products/services sales but also the firm's image. Therefore, it is very important to consider this factor when building a business model.

Maintaining the market position of a firm, which is the fifth factor, is indispensable. A good business model needs to use its resources to strengthen its market position by adding new products, features, applications, and values to attract customers. Some of the aspects of a business that market position include:

- Promoting and sustaining the brand names
- Adding unique value to products/services
- Assuring customer loyalty by constantly meeting/exceeding customers' expectations

Besides these guiding principles, entrepreneurs or firms need to also notice red flags such as distributions network were controlled by potential competitors, alternative technologies developed to meet the same need, well-founded potential competitors moving into the market. Another pitfall that must be avoided is not to focus on only the details of the firm's business only but to focus on the overall market; as in the long run, the ability to hold the market position is very much dependent on the overall characteristics of the overall market.

The last but not the least factor is business investment. There are some elements to evaluate business investments and risks.

A.   Return of Investment (ROI) – the good investments are the ones which have returns; therefore, it is critical to observe ROI especially when it starts the business (the first three to five years). If the ROI is less than 25% for the first three years, then the firm or business is under high risk.

B.   Industry Environment – if the industry as a whole has a very poor ROI and profitability, then the investment needs to be reconsidered.
C.   Revenue Producing Areas – If less than 50% of the investment is used in sales and production (revenue producing/generating areas), then the detailed investment allocation needs to be analyzed.
D.   Additional Investments – If incremental products/services require considerable additional investments, then the production needs to be re-evaluated.

10. IMPORTANCE OF E-LEARNING BUSINESS MODELS

According to Hoppe and Brietner (2003) [1], an E-Learning Business Model is important and useful because:
1.   It reduces complex events and relations and also helps in focusing on crucial success factors of a business.
2.   It forces providers to consider their opportunities systematically based on found decisions.
3.   It provides a basis for future decisions concerning E-Learning activities.
4.   It supplements E-Learning models and theories focusing on the pedagogical and/or technological dimensions of E-Learning.

11. E-LEARNING PRODUCTS AND PROVIDERS

Learning which is supported and/or made possible by the use of information and communication Technology (ICT) is defined as E-Learning. ICT may not only act as auxiliary means but has to be immediately connected with the learning processes. E-Learning becomes manifest in an individual E-Learning system. ICT suitable for enabling or supporting E-Learning is called E-Learning technology. Parts of the ICT are E-Learning applications, i.e. software applications which are suitable to support or enable E-Learning. Due to their complexity, four types of E-Learning applications are distinguished: drill and practice applications, (intelligent) tutor systems, simulations and CSCL (Computer Supported Collaborative Learning) applications. Applications are the core of an E-Learning system because they mediate standardized or individually configured E-Learning content. The basic components of an E-Learning system which are essential for its functionality are called the technical system. Depending on the technical realization, Computer Based Training (CBT) and Web Based Training (WBT) are distinguished. Didactical options and technological realization of WBT are usually more complex than those of CBT. E-Learning products applicable for mobile learning, i.e. for use with handheld devices like laptops or Personal Digital Assistants (PDA), are classified as Mobile Based Training

NANA YAW ASABERE* et al.   ISSN: 2250–3676

[IJESAT] INTERNATIONAL JOURNAL OF ENGINEERING SCIENCE & ADVANCED TECHNOLOGY   Volume-2, Issue-5, 1178 – 1191

(MBT). Nowadays, MBT is mostly a subgroup of CBT because the technical feasibility is not fully exploited. The MBT sector has become more and more important and complex (Hoppe and Brietner, 2003) [1].
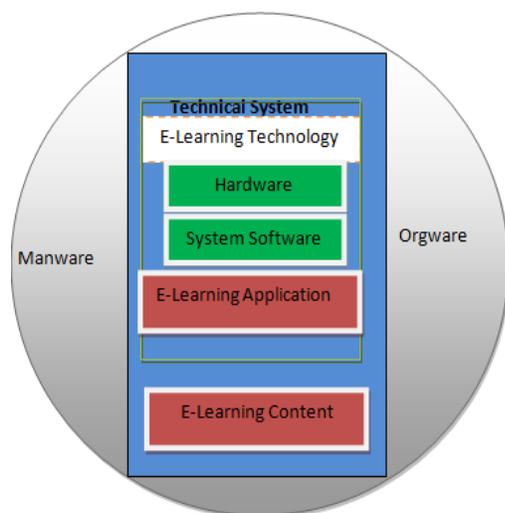

Fig-1: Components of an E-Learning System
Source: (Hoppe and Brietner, pp 3, 2003) [1]

The technical system as shown in figure 1 is supplemented on the other hand by manware, i.e. the people who use, administrate, maintain and/or develop other components of the system. On the other hand, E-Learning is supplemented by the orgware, i.e. all organizational regulations and concepts concerning E-Learning and its management. Every part of an E-Learning system which can be marketed autonomously is an E-Learning product. E-Learning products comprise on one hand, hardware, software and content in terms of digital data .e.g. HTML and XML data. On the other hand E-Learning products comprises of services in connection with hardware, software, content, manware and/or orgware. E-Learning products are offered by E-Learning providers. The market for E-Learning providers is very intransparent due to the heterogeneity and multitude of existing providers (Hoppe and Brietner, 2003) [1].

According to Hoppe and Brietner (2003) [1], E-Learning providers can be divided into four main segments:

- **Content Providers:** offer predetermined E-Learning content. Content is either individualized or standardized. Content is often provided by publishing houses such as PONS (www.pons.de).

- **Application Providers:** offer E-Learning applications. Application providers often cooperate with the content providers to establish an E-Learning platform. Sometimes, applications are offered as free or shareware. Some examples of application providers include Hyper wave (www.hyperwave.de) and netucate (www.netucate.com).

- **Hardware Providers:** offer E-Learning hardware. In most cases there is no specific hardware for E-Learning. Special E-Learning can be required due to special types of data, e.g. video or virtual reality equipment.

- **Service Providers:** Offer E-Learning services. E-Learning services complement the mediation of E-Learning content by E-Learning applications. E-Learning services can directly relate to learning processes. Examples are the provision of information and communication platforms, e.g. CLIX (www.im-c.de). E-Learning services can also have a supporting function. Examples for supporting services are hardware support (hosting services) and software support (administrative support). Furthermore supporting services can result in training, marketing, controlling, evaluation and certification of related activities.

- **Full Service Providers:** Offer all-in-one solutions which compromise products and services in relation with the whole E-Learning system.

12. PROPOSED E-LEARNING SYSTEM FOR UCC

With the adoption of E-Learning, the University Of Cape Coast hopes to widen access to tertiary education to most of the qualified applicants who because of lack of residential and academic facilities are not able to gain admission to pursue further studies. Through E-Learning, UCC also hopes to make learning and teaching flexible. The aim is to reproduce the functionality and the "look and feel" of the traditional classroom. It also wants to reduce cost or improve the cost effectiveness of running programs in the institution. Last but not the least the University of Cape Coast seeks to enhance its reputation. Various definitions have been given for E-Learning but it must be restated here again that for the purposes of this research paper the definition of E-Learning would refer to the use of ICTs (i.e. the internet, intranets/extranets, audio, video, etc) to extend access to tertiary education to those who are unable to attended on-campus for whatever reason, by providing quality and flexible education. A case in which the traditional classroom teaching is combined with ICT would be efficient as it would enable dialogue between students and between students and their tutors, even outside the classroom. ICT would enable lecturers to package learning opportunities in an increasing number of alternative ways so as to best meet the varying needs of different students.

NANA YAW ASABERE* et al.   ISSN: 2250–3676

[IJESAT] INTERNATIONAL JOURNAL OF ENGINEERING SCIENCE & ADVANCED TECHNOLOGY   Volume-2, Issue-5, 1178 – 1191

To design an E-Learning system, the type of E-Learning methodology to be used needs to be chosen or selected. After the type of E-Learning system is chosen, the approach to be used in implementing the system (i.e. bottom-up or top-down approach) and the cost of the facilities required for the implementation of that E-Learning system also has to be considered. The technical design and service design strategies also have to be considered.

With reference to Falch (2004) [8] cited in our previous work (Asabere and Enguah, 2012) [10] we propose an E-Learning system using the Model **C** (E-Learning with combination of occasional presence (blended learning)). Model C involves parts of the learning process taking place in a class room and other parts being done elsewhere (e.g. at home or at work) using ICT based learning facilities and tools. In Model C, E-Learning is combined with traditional class room teaching. A wide spectrum of approaches/models is possible here. The 'electronic' part can be with or without communication, and it can either be a minor supplement to the traditional teaching, or the traditional teaching can be a minor supplement to the 'electronic' part of the course. Use of classroom teaching adds to the economic costs, but it also helps to make E-Learning more efficient, as it facilitates a dialogue between students and teacher/instructor/lecturer – also outside the classroom.

The top-down approach would be used in implementing the E-Learning system. This approach is being used because of the university's long term vision. In using this approach, the university's own resources will be used. E-Learning applications (Dropbox and Google groups) would be used at the centre of the E-Learning system to support one or more sub-process of the educational value chain. These processes would include learning planning, content development and brokerage, learning delivery, assessment and evaluation.
A group would be created for each class or program using Google groups. Through Google groups, students can access lecture notes and communicate effectively over email and the web; they can upload their assignments and share their work with other course mates. The application for learning planning would involve tasks such as knowledge gap analysis, personal development planning and other activities related to the management and development of human capital. The content development and brokerage application would support the acquisition of content via various channels. It would include authoring tools and online market places for courses or content. There would be applications for "learning delivery" support (collaborative) learning in courses which are delivered remote or held in classrooms and lecture halls. Assessment and evaluation applications will be used to certify students' newly acquired competency or to assess the quality of the course.

One tool that would also be used in this proposed E-Learning system apart from Videoconferencing is Computer Conferencing. This combines the functionality of electronic mail and electronic bulletin or message boards. Messages sent to a computer conference are stored in a central location rather than being distributed to individual e-mail boxes such as in a mailing list. Just as in face-to-face conference settings where participants have to move to particular rooms to hear particular speakers, participants in a computer conference are required to actively access the emails in computer conferences which will be waiting for action in that conference. Once they are logged into the conference, participants can read a response and act on it. This is asynchronous communication because a participant can respond to a message or contribute to a discussion at anytime and from any place. The messages sent to the conference are stored on the host computer from where a participant can read it, reply to it, or start a new thread (Velayao, 1994) [9].

12.1 Connection of a Videoconferencing Facility, Equipments Required and Cost Involved

1.   The Videoconferencing Equipment-*Video Camera* (**$8,000 - $16,000**) Cost is dependent on the type of facility. Different facilities are available i.e. Point-to-Multipoint Videoconferencing Equipment (**More Expensive**) and Point-to-Point Videoconferencing Equipment.
2.   The Screens (Two Television Screens: **$2,000 - $3,000**) cost is dependent on Television Brand, Television Architecture and Television Screen Size.
3.   Projector Screen for Projecting presentations (**$500** - **$1,000**) dependent on the quality.
4.   The Communication Link through an Internet Service Provider (ISP) – Bandwidth 512 Kbps, 1Mbps, **and 2Mbps (Required) - $3,000 per Month**.
5.   Connection of the Videoconferencing facility has to be done through ICT Professionals with the required expertise and knowledge.

13. PROPOSED BUSINESS MODEL

The possible business models will be based on only tertiary-wide business models. The key areas of measurements for consideration include: effective business transactions, roles optimization, effective cooperation, value maximization, customer satisfaction and revenue generation. With regard to E-Learning services, there are certain uncertainties that need to be clarified by the business model:
A.   **What students want?** – What kind of programs will attract students and workers to the University of Cape Coast (UCC) and make them willing to pay fees for tuition.

NANA YAW ASABERE* et al.   ISSN: 2250–3676

[IJESAT] INTERNATIONAL JOURNAL OF ENGINEERING SCIENCE & ADVANCED TECHNOLOGY   Volume-2, Issue-5, 1178 – 1191

B.   How to manage the end-relationship with students? – The business model must address who will be the best candidate to manage UCC student relationships.

C.   How to maximize the value to students? - How to deliver and develop cost-effective and appealing programs and content.

D.   How to reuse the existing architectures and network of the university in order to produce high margin programs/services? – What synergies can be done for existing activities?

E.   How to deal with payment issues? – What billing mechanisms need to be used, what sources of income are applicable (e.g. subscription fee, transcript fees, introductory letter fees, advertisement, etc.) and who is the best candidate to do the billing stuff.

F.   How to invest money for E-Learning business? – What are the potential investment capabilities for stakeholders and how to prioritize the investment areas (i.e. which areas need a lot of investment as soon possible and which areas do not?)

G.   How to manage the necessary E-Learning resources? – Who has the access right to the E-Learning system and components, networks, etc. and who should have these rights?

Grouping	Business Model Component
Product	*Value Proposition* –diplomas, degrees, transcripts, introductory letters
Customer Interface	*Target Customer* – applicants seeking university education and workers who want to upgrade themselves (i.e. Female workers who cannot leave their kids to attend on-campus education).
	Distribution Channel – the Internet, Regional Centres, Radio & Television, National Dailies (e.g. The Daily Graphic, Ghanaian Times, etc.).
	Relationship - UCC would develop two customer segments or modules, one for workers and the other for senior high school graduates who are not working.
Infrastructure Management	*Value Configuration* – 1. Sale of application forms. 2. Processing of forms. 3. Admission of selected students. 4. Registration of students and also the provision of accounts to them for access to E-Learning portals and libraries. 5. Commencement of lectures. 6. Writing of examinations. 7. Awarding of degrees / diplomas.
	Core Competencies – Lecturing and managing of ICT facilities and equipment.
	Partner Network – Mobile Operator, Other educational institutions which serve as centres.
Financial Aspects	**Cost Structure** – Cost of broadband service. Cost of Videoconferencing facilities for all the regional centres. Cost of computers for all the centres. Cost of using rented premises of other institutions as regional centres.
	Revenue Model – Sale of application forms, hiring of video conferencing facilities at centres, charging fees for the processing of introductory letters for acquisition of visas and passport, charging for the issuance of transcripts, testimonials, attestations and replacement of ID cards.

Table-2: Business Model Groups and Components

13.1 Model A: E-Learning Business Model Based on Rented Premises

In this model, UCC will rent premises for the E-Learning centres. The current existing system discussed previously depicts that CCE of UCC has nine (9) rented regional centres in nine (9) out of the ten (10) regions of Ghana. The main problem of this model will be the monthly rental charges UCC will have to pay to the owners of the premises. Another problem of this model is the uncertainty of the continuity usage of the premises. Since the premises are not owned by UCC, the University will not always be assured of its usage until a negotiation is made between the University and the owners of the premises. A disadvantage of this model is the limitation to its usage. Every installation of equipment or change in structure of the building (premises) will require permission from the owners and if this is not done, it will mean breach of contract.

NANA YAW ASABERE* et al.   ISSN: 2250–3676

[IJESAT] INTERNATIONAL JOURNAL OF ENGINEERING SCIENCE & ADVANCED TECHNOLOGY   Volume-2, Issue-5, 1178 – 1191

13.2 Model B: E-Learning Business Model Based on Owned Premises

In this model, UCC will build their own regional centres for the E-Learning in nine (9) of the ten (10) regions of Ghana. This model will waive the monthly rental charges UCC will have to pay to the owners of the current premises being used as regional centres. It is more costly as compared to model A but is more advantageous and reliable in the long term. The certainty of the continuity usage of the premises is assured, since the premises are now owned by UCC. There is no need for negotiation for the use of the premises and UCC can also hire the premises to other institutions that require the usage of their E-Learning and ICT facilities such the videoconferencing facility. This will generate more income for UCC especially at the time the University is on vacation. An advantage of this model is that UCC will build their premises in the regional centres based on the standards and required building plans for an E-Learning or distance learning centre which will involve an appropriate area in the building for a videoconferencing

Facility and the provision of the required electrical and networking connection can be made available during the process of building the premise.

13.3 Recommended Business Model

In order for us to be able to recommend a suitable model, we conducted a SWOT analysis for the business models discussed above. The SWOT analysis is depicted in Table 3 below.

BUSINESS MODEL A	BUSINESS MODEL B
Strengths: 1. Low initial cost to start as compared to Model B. 2. Would not have to cater for the salaries and social security contributions of cleaning staff at various centres.	**Strengths:** 1. Since the built premises are for UCC, modifications and installations can be done without seeking permission from an external authority. 2. Cannot be ejected from premises.
Weaknesses: 1. Uncertainty of the continuity of usage of premises. 2. Modifications to buildings cannot be done without the owner's permission. 3. High rental charges.	**Weaknesses:** 1. High initial cost (i.e. cost of land and building). 2. Increased wage bill, as salaries and social security contributions of cleaning and auxiliary staff would have to be paid.
Opportunities: 1. Can help foster cordial relationship between the two institutions.	**Opportunities:** 1. Can hire out premises. 2. Can help foster cordial relationship between UCC and other tertiary institutions.
Threats: 1. Can lead to bad blood, depending on how tenancy agreement/contract was terminated. 2. Threats from competitors who want to use premise can lead to the ejection of UCC.	**Threats:** 1. There might be difficulty in acquiring land and sometimes land may be sold at exorbitant prices.

Table-3: SWOT Analysis of Business Models A and B

13.4 Analysis of Business Model A and Business Model B

University of Cape Coast (UCC) can use its strength as a reputable institution of learning to foster a sort of sister relationship with the institutions that serve as centres which they rent, however this opportunity can be utilized also when the university uses Model B. However, if Model B is implemented, UCC can rather earn revenue from hiring out its own (built) centre with video conferencing facilities. With Model B there is the assurance of continuity of usage of the premise as opposed to Model A where one can be ejected or rental charges increased without notice. Though some may argue about the initial cost of acquiring land and putting up the centres in the various regions and some districts, this cost can be recouped through renting out these centres to other institutions, groups and organisations. Based on these analyses we propose Business Model B as shown in figure 2.

In the Proposed E-Learning Model (Model B) shown below in Figure 2, the E-Learning Centre (in this case the Centre for Continuing Education (CCE)) is responsible for all the issues pertaining to the value chain. This includes learning planning, content development and brokerage, learning delivery, assessment and evaluation to student care; however, there will be some assistance from mobile service providers and equipment manufacturers or dealers. There is widespread use of laptop computers among tertiary students and most of the working class; also these are customers of mobile service providers. With the help of these partners, most basic services can be seen in the form of information delivery such as admission status, course registration, examination results, etc., from the university to the respective stakeholders (i.e. students, faculty members, staff, etc.). The cellular network of

NANA YAW ASABERE* et al.   ISSN: 2250–3676

[IJESAT] INTERNATIONAL JOURNAL OF ENGINEERING SCIENCE & ADVANCED TECHNOLOGY   Volume-2, Issue-5, 1178 – 1191

the mobile service providers will be used as a return channel to students' data and billing. The role of equipment manufacturers is to sell Personal Computer devices to students. The University in rare cases can negotiate on the behalf of students so as to get concessionary rates from the manufacturers. Advertisers will have the opportunity to advertise products/services relating to students, through the E-Learning system of the university. Since the University of Cape Coast has its own centres, it can rent it out to other institutions or organizations that do not have such a place.
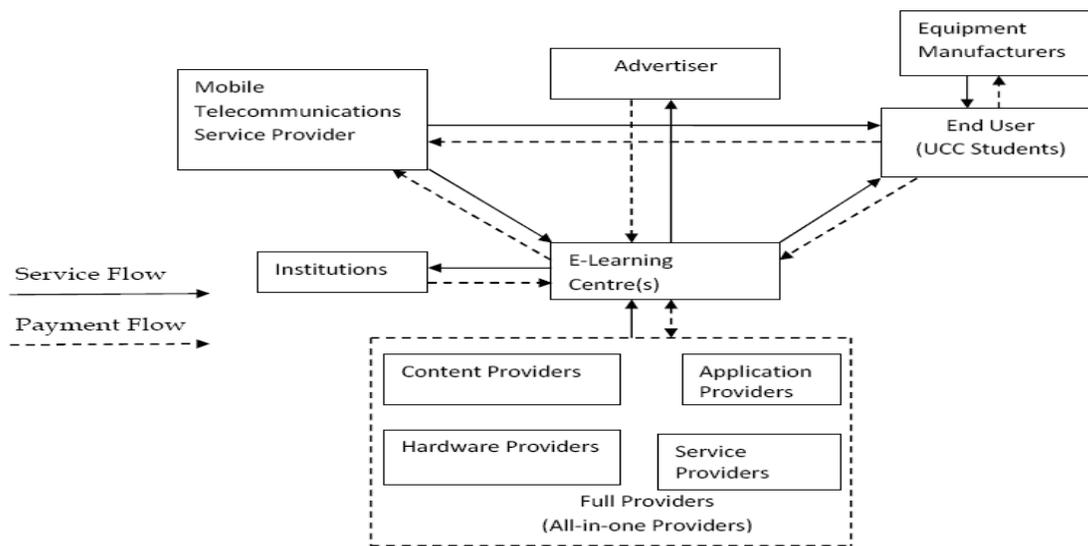
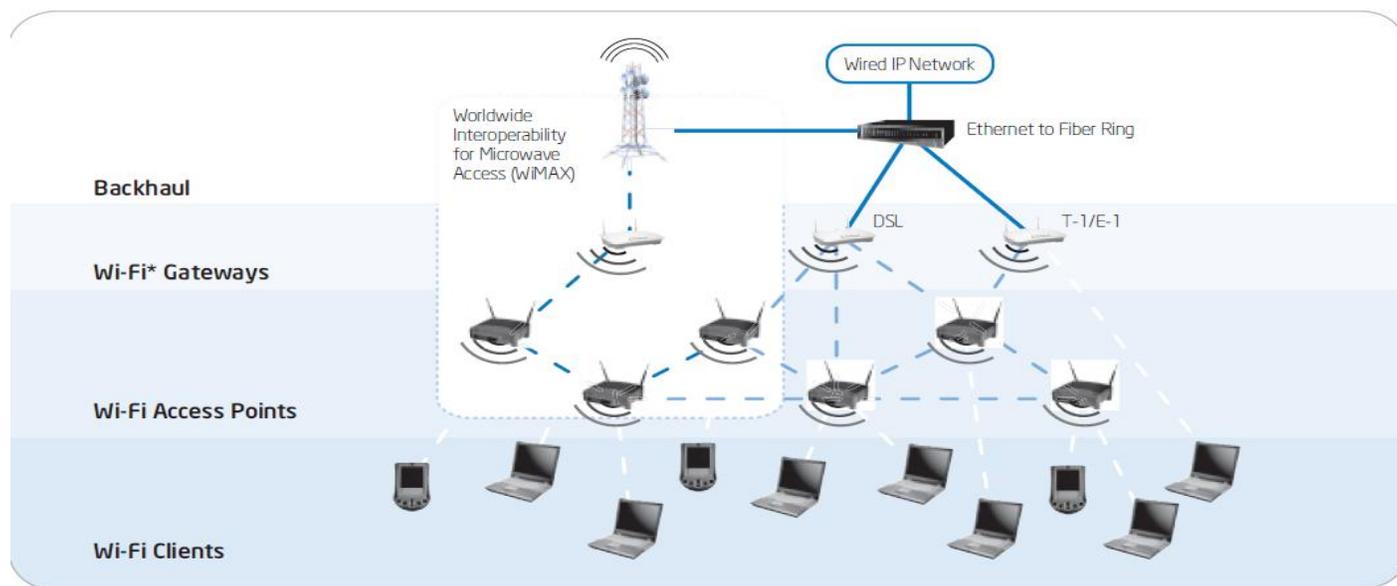

Fig-2: Proposed Business Model (Model B)

The Centre for Continuing Education (CCE) would have two different E-Learning modules running concurrently. One will be for full-time students and the other for part time (workers). This is because workers cannot attend lectures during the day. There will be a class size of forty (40) for full-time and twenty-five (25) for part-time for effective teaching and learning at each of the learning centres across the country. The time plan for the various programs will differ depending on the status of the student (i.e. full-time or part-time) and the programme he/she is pursuing. For example, if a full-time pursues a two year programme the part-time will do it for three years. This is because part-time students would only come for lectures after the close of work when there has to be face-to-face contact with their course tutors or lecturers.

Enrolled students of the proposed system shall be asked to pay fees for Course tutors' allowance, the modules, examinations, use of facilities, technology and overhead charges. The variation in fees is determined by the number of courses students are expected to take per year. The fees are subject to yearly review. Student-teachers who cannot afford outright payment shall be permitted to at least pay half of the total fee and spread the rest over 4 monthly installments. The full financial benefits in quantum terms cannot be known right now until the e-learning system is operational, as certain agreements and contracts will have to be negotiated. However it can be seen that revenue will be generated from renting out the e-learning centre or facilities such as the video conferencing facility. Also revenue will be earned from companies who advertise on the e-learning platform.

14. TECHNOLOGY AND IMPLEMENTATION OPTIONS

14.1 Proposed Technology

Using Wi-Fi and WiMAX open broadband wireless standards and implementing mobile computing, the University of Cape Coast (UCC), the Government of Ghana (GoG) and their partners can quickly and cost effectively deploy broadband to areas or centres not currently served, with little or no disruption to existing facilities. Standards compliant WLANs and proprietary Wi-Fi mesh infrastructures would be installed throughout the regional centres of CCE. Standard compliant WiMAX products will be used to provide non-line-of-sight (NLoS) backhaul solutions for these local networks and WiMAX subscriber stations will provide internet access to learners, as shown in figure 3 below.

NANA YAW ASABERE* et al.   ISSN: 2250–3676

[IJESAT] INTERNATIONAL JOURNAL OF ENGINEERING SCIENCE & ADVANCED TECHNOLOGY   Volume-2, Issue-5, 1178 – 1191

Fig-3: Proposed Technology
Source: Wireless Technologies and E-Learning: Bridging the Digital Divide, White Paper Intel Information Technology (2006) [11].

With this technology in place and with the help of mobile telecommunications companies, a centralized SMS centre would be established through the collection of mobile phone numbers, and sending group SMS via the network. Through this, information such as:
1.   Reading Lists – The list of recommended books and journals;
2.   Lectures, meeting schedule, examination dates;
3.   Academic information about students;
4.   Crucial assignment reminders.
5.   Announcements – information about new activities and changes in schedule; can be disseminated.

15. TECHNIQUES FOR EFFECTIVENESS AND EFFICIENCY IN THE PROPOSED E-LEARNING SYSTEM IN UCC

15.1 Access Control

Access control of the E-Learning system would be of paramount importance in the implementation of the E-Learning system. Publicly accessible conferences will require different types of access and control than those within the context of a formal online course. In a publicly accessible conference, a conference host or moderator at any of the centres of the Centre for Continuing Education (CCE) will

have control over who can access the conference and what level of access is allowed to participants. For example, it might be necessary to give some participants read and write permission, and others read only access. The situation in a conference within a formal course would be different as every participant there will be required to have read and write access. Moreover, the host of a conference should have good tools for managing a conference discussion, such as tools for weeding out obsolete topics, archiving those that are worth saving but no longer active, and moving a divergent thread of a topic to a new topic of its own.

15. 2 E-Moderation Skills

The fact has not been lost on us the researchers that, while creating opportunities for learning, online learning environments also create demands on learners for new skills in managing their own learning. Being successful in such learning environments requires learners to have the ability to organize, evaluate, and monitor the progress of their learning. Not all learners possess these skills, and so they have to be taught how to take advantage of the opportunities that online learning affords. To remedy this problem, learners who enrol for a course or program would be given orientation (example orientation of participants for computer conferencing) or taught basic computer skills which will help in their use of the system. In a formal educational setting, it is very likely that

NANA YAW ASABERE* et al.   ISSN: 2250–3676

[IJESAT] INTERNATIONAL JOURNAL OF ENGINEERING SCIENCE & ADVANCED TECHNOLOGY   Volume-2, Issue-5, 1178 – 1191

most of the participants will not know each other. So it will be important to provide them with an opportunity to introduce themselves to others in the group. This will comprise explaining their academic and other interests but more importantly their specific interest in the subject. Some students will be familiar with the conventions of computer mediated conferencing, while others will not. Some may be threatened by the technology and irritated by many of the conventions of this mode of communications; therefore common ground rules for communicating online will be agreed with the participants. Respect, tolerance and trust among the group are very important. The moderator will set the tone for the communication, and try to model those sorts of behaviours for the group to emulate. These would include things like, how much to write in each message, how frequently, and the tone of the language that might be appropriate. Some agreement at this stage on the etiquettes of communicating on the net (also known as "netiquette") would be appropriate.

15.3 Functioning

To ensure that a group of participants is on track for completing assigned tasks. Clear goals and outcomes for a conference would always have to be made. In addition to this, the structure and direction of discussions would be provided by the moderator to ensure coherent conversation on the assigned topic. Participants should be encouraged to participate responsibly and equitably to ensure that everyone is contributing their fair share to the discussions. Participants should also be encouraged to share their ideas and opinions with group members in good faith. They ought to feel free to ask questions, and seek the opinions and support of others in the group. Through this conference participants are able to build a deeper level understanding of the subject matter. Strategies to support this will include summarizing the ideas and thread of the discussion at regular intervals, asking participants to assist and check each other's understanding of complex ideas linking theory with practice and elaborating current material with previously learned material.

15.4 Fermenting

This starts to happen when e-leaning participants are engaging more readily in debate and discussion about the central issues, challenging each other's ideas, meanings, reasoning and concepts. Any controversies in this regard need to be handled very carefully by the moderator, and students should be taught the skills to manage debates. Criticizing ideas without criticizing people is an important but difficult skill to develop. It is important to challenge the ideas of others but it is essential that students learn not to alienate other group members in this process. For example, ideas can be challenged in subtle ways by asking questions, suggesting alternatives,

asking for their reasoning and justification of arguments. Students could be encouraged to find out how the thinking and reasoning of group members' differ and how the different ideas could be integrated into a smaller set of propositions on the subject. At the end of this process, the moderator must bring the discussion to some sort of a close.

16. PHYSICAL DEVELOPMENTS

The E-Learning system proposal for UCC requires the establishment of videoconferencing centres. Videoconferencing is a real time connection between two or more physical locations that is composed of both audio and video components. In most cases, the typical videoconference will allow full interaction between the locations. The ten (10) distance learning centres under the CCE and a new resource centre at UCC have to each be equipped with the videoconferencing facilities which will be networked an interconnected with each other (Point-to-Multipoint). In a situation such as this, Model C methodology of E-Learning as proposed can be implemented. Currently lecturers travel from UCC to the various distance learning centres for lecture delivery. There are disadvantageous situations which involve the lecturers travelling from one centre to another. For example a lecturer may have to travel from the Ashanti Regional Study Centre to the Brong Ahafo Regional Study Centre after delivering a lecture at the Ashanti Regional Study Centre in the morning. These situations are detrimental to the lecturers. When the proposed system, the lecturers need not make all these travel arrangements and much more students can be lectured/taught at a particular time, saving time and cost for UCC. Two different scenarios can exist with this type of E-Learning proposed system at UCC:

16.1 Proposed Scenario A

Since there will be a network of videoconferencing facilities at each study/distance learning centre, if there is a lecture of a particular subject or course involving all study centres', the lecturer can deliver the lecture with students at Greater Accra Study Centre and students from all other study centres' will participate in the lecture. In this case the lecturer will not travel to the other study centres'. The only disadvantage in this case is that, the students at the other study centres will not feel the physical presence of the lecturer and the interaction is through a video link. There will therefore be situations in which the presence of the lecturer physically and face-to-face is rotational from one study centre to the other, so that there will be fairness in term of lecturer presence or face-to-face lectures at every distance learning centre. Communication between students and lecturers will be through e-mail or chatting (Yahoo Messenger or Skype). The student usually has to register on the E-Learning portal (Learning Management

NANA YAW ASABERE* et al.   ISSN: 2250–3676

[IJESAT] INTERNATIONAL JOURNAL OF ENGINEERING SCIENCE & ADVANCED TECHNOLOGY   Volume-2, Issue-5, 1178 – 1191

System (LMS)) designed by UCC as part of the proposed E-Learning System, so that he/she can download learning material and monitor events such as calendar and examination dates as well as lecture hours. Members of a LMS which involve the lecturers and students have user names and passwords which they use to log on to upload assignments and have access to most of the material for lectures, incoming events as well as past events.

16.2 Proposed Scenario B

With the establishment of a videoconferencing centre at UCC, education at UCC will be enhanced, improved and promoted. Students need not travel from their various home regions to Cape Coast for their education. Students from all over the country can apply for programmes at UCC, and when they are admitted they can have access to lectures and training through E-Learning by the use of the established videoconferencing ICT facility. UCC can sign a memorandum of understanding (MOU) with another Institute or University in other countries where students abundantly apply for admission and establish a videoconference centre so as to cater for international or foreign students. The two centres will be linked so that a lecture taking place in UCC will be linked to the other centre where admitted students of UCC will attend lectures in their home country. UCC can admit more students on the basis of E-Learning and generate more revenue. The current accommodation facilities and lecture halls are not enough for admission of a large number of international students. As enumerated in scenario A, the disadvantage in this case is that there is no physical presence of the lecturer at the other country and sometimes the video and audio quality may not be so good enough. But with a strong network and bigger bandwidth size these conditions can be minimized. The communication activities will be the same as that of ScenarioA.

17. CONCLUSION

17.1 Summary

Education is the legacy that any country can bestow on its citizens especially the youth of a country. The expansion of UCC and other tertiary institutions in Ghana has not been able to meet the yearly increasing demand for tertiary education though a major policy in the tertiary education reform is to make it possible for all students who satisfy the requirements for admission into tertiary institutions to gain access to the institutions. Although there have been an expansion in enrolment figures over the years, it is not significant when compared with the number of applicants who apply to the various public tertiary institutions. It is in the light of this and the increasing population growth of this country, this paper

recommend e-learning as the way or solution to the various factors that prevents qualified applicants from gaining admission. Also e-learning can help provide avenues for working people and those who for one reason or the other have had to truncate their education for a number of years to re-enter or acquire higher education through other modes. It provides opportunities for lifelong learning.

17.2 Cost and Funding

Over the years, the issue of funding tertiary education has become contentious and a vexed one. Governments (past and present) have faced tremendous difficulties in funding tertiary education. A series of workshops and debates have been organised in the past to find other sources of funding tertiary education. Putting an e-learning system in place which has a business model can be one of the sources for funding tertiary education. The cost for developing such an e-learning system would not be very substantial as CCE runs a distance education programme and as such have most of administrative structures in place. All that is left is to develop the technological or information communication technology (ICT) infrastructure. Yes, it's true that some have argued that education especially public institutions should not be run as profit making enterprises, but with the business model and plan that we have put in place or proposed, students should not be paying any substantial amount different from their colleagues in residential facilities on the university campus. The difference would come from using e-learning and technology facilities available at the various centres. The bulk of revenue would be degenerated from companies that deal in students' or educational products and services advertising on the e-learning system and other services offered to students such as transcripts, introductory letters, etc.

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