

# *E-University Lecture Delivery Model: From Classroom to Virtual*

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**Abstract**— The failure of the UK government in setting up the first e-university in the early 2000 is attributed to several reasons including poor business models, branding, disruptive technologies, lack of organizational structure that accommodates such challenges, and failure to integrate a blended approach. Key to this failure is the lecture/lesson delivery model whereby e-university lesson models did not adapt much of the original classroom model of teaching with that of the virtual environment. A key obstacle is believed to be the lack of technologies of the time to support such processes. The conditions have since changed and are set to continue to change. This paper looks at academic research, technological innovations, employs process analysis, and reflective analysis to provide a lecture/lesson delivery model for the next generations of e-universities. The aim is to find to what extent current online lecture/lesson deliveries have evolved. In this process, the team reviews the case study of a UK e-university using Adobe Connect learning model that mirrors much of the physical processes of lecture/lesson delivery. Using Riva model, the paper compares the physical with the virtual model of lesson/lecture delivery processes. The paper concludes that this key process has shown promising results but there remain some challenges for e-university processes to overcome.

**Keywords**— E-university, Lesson Planning, Virtual learning, E-learning.

## I. INTRODUCTION

With the advancement of Internet, information is freely available in all forms and various sources can be accessible. Students reach those rich content with few clicks to acquire, process and disseminate through social media tools to their friends and peers.

New skills such as computer literacy, knowledge creating, sharing, co-operative working, open source movement, collaborative working have become very important issues for academia. In the speed of information age, new generation students require new forms of learning platforms and communication channels while they already use similar applications in their private life. New forms of educational approaches needs to be more students oriented, collaborative and interactive [1]. In this context, Tapscott and Williams [2] suggest collaborative classrooms, note taking, lecturing, listening may not disappear but live alongside the new and innovative educational processes. Wissema [3] indicates that

the new university concept has more industry-style collaborative framework rather than old classroom school model. Innovation, interaction, collaboration are key elements along with technology-driven initiatives. Similarly Tapscott and Williams [4] concentrates on user-generated media, social networking, crowdsource effect and peer production for the new university concept which mass collaboration is a new form of online collectivism. Clearly the lesson and lecture delivery via classroom is a key element in moving forward the concept of e-university. This paper will present a review of the literature with regards to the evolution of e-university including lessons learned from previous failures. In addition, the paper will focus on lecture/lesson delivery process as key process in this transition. Using case two distinctive case studies of physical and virtual lecture/lesson delivery, the paper will reflect on improvements and limitations of the move towards virtual classroom within an E-university process.

## II. LITERATURE REIVEW

Universities, as knowledge based organizations have long been accepted as major social and cultural institutions that serve developments in various forms [5], [6]. Two distinctive forms of universities are traditional campus base form, or electronic form such as online, distance, virtual and mobile base [7]. This does not distract from what the fundamental mission of any university, which is to teaching, research and service [8].

In the literature of higher education there are various names and forms given to online learning including distance (online) learning/education, virtual universities, virtual learning environments, e-learning, mobile learning, social networking and Web 2.0 based education. Some other definitions of virtual teaching and learning found as Learning 2.0; university 2.0; pedagogy 2.0; and library 2.0 [1, 9, 10, 11, 12, 13]. For the purpose of this paper, e-university is going to be defined as virtual university or educational institution that performs all its teaching, learning, and administrative processes at a distance from the learner [14]. In this context, an educational institution to be considered an e-university it needs to delivery every aspect of university online including teaching, processes, structures, working place, staffing,

administration, support, aid, assessments, evaluations, and services [15]. Some of the requirements and drivers need to be considered when implementing the course programs to target student groups. These requirements include technology and changing expectations, content creation and distribution, accessibility, face-to-face on campuses, open access sources, ethics, legal and social issues, privacy, learning skills, motivation, curriculum-administrative needs, system management, and communication with peers [13, 16, 17, 18]. Tapscott and Williams [2] also argue that the new shape of university has to have two important characteristics such as ‘collaborative learning’ and ‘collaborative knowledge production’ both traditionally linked to classroom operations.

#### *A. The evolution towards E-university*

Online learning approach is revolutionizing access to reach mass population with rich and various content availability. So far online learning has been designed to complement rather than compete with old school learning. Online learning provides enormous sources to access the content and enrich sharing among peers. This new shape of education forces educational organizations to adapt themselves and compete in highly demanding educational area. Students are demanding more access to sources while organizations try to prepare more competitive learning packages for them. Mazoue [10] suggest that the emergence of learning sciences, the wikification of knowledge, the unbundling of faculty roles, and the migration of learning online are driving fundamental institutional change toward location-independent alternatives. Therefore Internet is becoming the dominant infrastructure for knowledge exchange among people and new generations of students [2].

#### *B. Experiments with E-university and lessons learned*

In the e-commerce boom of the early 2000, the UK secretary of education declared the formation of UK E-University (UKeU). The aim is deliver UK higher education across the globe. The project, however, was acknowledged to be public failure and the project was abandoned in 2004 [19]. In a reflective review, Bacsich presented some of the lessons to be learned from UKeU failure to be the importance of branding, poor business models, disruptive technologies, lack of organizational structure that accommodates such challenges, failure to integrate a blended approach, and appreciation that many of the applicants are from countries where English is not their first language [19]. Failure to integrate a blended approach is key here as it refers to the experience that student got from the delivery of lessons and lectures online as oppose to their expectations to how this process takes place in the physical environment.

Another element discussed in success of e-university is the appropriate use of technology. Some of the universities have experimented e-university concept in the virtual environment with some successes [20, 21], but limitation in what the technology is able to provide has impeded some of the early efforts. The ever changing and shifting nature of technology is reported again as problematic. For the full concept of E-

universities to be realized, strategies have to be in place that exploits under-utilized capacities of technologies to improve student engagement, motivation, and higher order thinking skills [22, 23]. Thus the Internet expansion has become an enabling technology for the revival of e-university by providing infrastructure for new innovations that have not been available back in early 2000’s when UKeU was formed. There have been several technological advances that are set to usher new opportunities for the raise of e-university. Researchers have predicted that Internet of Things (IoT), virtual reality, augmented reality, quantum computing, artificial intelligence, and simulated intelligence are set to transform educational delivery and resurrect the idea of a fully integrated e-university [24]. Other areas that have seen the impact of these improvements include faster video streaming, virtual reality [25], teaching experiments improvements [26], and augmented reality simulation games in education [27].

There are some considerable advantage in using technology to automate educational teaching. Having new teaching and learning technologies can reduce costs and may increase quality at the same time. Many high ranked universities such as MIT, Harvard, Stanford, University of Michigan, and University of Pennsylvania are delivering online free courses [28]. Students would be more flexible to choose their preferred courses, at their own pace, accessibility independent of location as well as having better value for money [29].

#### *C. Current literature on existing online university models:*

There has been attempts to design and re-model aspects of online learning. The model of Global Network for Higher Learning focuses on knowledge created and shared in teaching and learning processes of a university by suggesting open content and the emerging global meta-university as a model. In this model there are five stages which are course content exchange, course content collaboration, course content co-innovation, knowledge co-creation, and collaborative learning connection [2].

Another example is that of Massive Open Online Courses (MOOCs), which aims to reach millions of learners around the world. Example of MOOCs are Coursera, a non-profit venture that supply professors and lecturers from 62 universities and provides free access to 50k to 100k users and supported by leading professors [30]. Other examples are edX (Harvard, MIT) and Udacity [30]. There are some other examples as open initiatives like; ‘MIT’s Open CourseWare’ and ‘Merlot’ [31].

In all these cases, the models represents important strides towards e-university but failed to complement the full process aspects of a physical university in the conventional way. They represent variations that can contribute to the process and specifically the process model for universities moving from physical and virtual. Prerecorded lessons and content uploading fail to account to the real experience students get from the physical university and ability of instructors to apply different pedagogical approaches to teaching. To truly appreciate the gap, there needs to be a

comparison between physical and virtual classroom interactions. There has been several works done with regards to physical university process modelling including automation of key processes. The team, however, could not find in the academic literature a suggestion of a fully virtual model for lecture/lesson delivery in a truly e-university process model.

#### *D. Process Modelling:*

Process modelling identifies processes in two different ways; an abstract model and a detailed model [32]. The purpose of modelling is to link the process design with the implementation. In the abstract model, an overall picture about the organisation's processes would be drawn. However, in the detailed model, every process could be investigated independently.

The generated model could then be used to produce a prototype for the flow of work and the flow of information; consequently, improvements could be easily managed [33]. Process modelling can be used to break an organisation's activity down into small processes made up of actions and interactions. The modelled processes can then be analysed and perhaps improved. New processes can be designed and the old ones altered. With the support of business process management software, processes in a model can be enacted to become real processes in the organisation.

##### *1) Riva Method*

The Riva method of process modelling is considered a business-oriented rather than software-oriented, in that it focuses on the management of business entities through the actions and interactions of different roles, rather than on a reduction of business to logic [34].

Using Ould's Riva method, the educational Process model is retrieved in this paper to map the traditional educational processes onto the automated/online educational system while focusing on the key process of lecture delivery. The retrieved diagram is the overview process architecture that explains the core educational processes ignoring any designed processes that are not essential for the educational process.

At this stage the paper will focus on the detailed Role Activity Diagramming (RAD) of 'Handle a lecture' Process to explore the detailed activities in this process.

The architectural diagram is based on the essential entities that represent the core of the organizational business where Ould referred to them as Essential Business Entities (EBEs), however, in some cases EBEs are not enough to fully represent the real business. Organizations might need to design their processes in a different way than other businesses in order to get their work done, in this case Ould [34] referred to this as Designed Business Processes (DBEs). Whenever the designer cannot ignore DBEs to be included in the model they could be added.

EBEs are then reduced based on the most important entities that the company cannot avoid to represent Units of Work (UOWs). Where each UOW can be tracked and followed from time to time. To make it possible, UOWs become either

Case Process (CP) or Case Management Process (CMPs). In a CP, each case arrives to the processes needs to be handled and tracked. If the cases are too many that in this case they might require management, a CMP is added to plan, organise and arrange the processes before sending them to the CP. Also the diagram shows the interactions and the relationships between CPs and CMPs. Accordingly, the focus in this research is on the lecture process. The process is analysed based on the data collected and observed from two universities; one is running the traditional lecturing and the second one is running it virtually. The RAD is used to explore the activities that are taking place in the same process for the two universities.

Riva technique is one of the techniques that is used to show the details of how organizations run their processes and activities in a dynamic view and on different detailed architectures. The model also could be used to be generalized on other organizations in the same line of business, which will support the study to map the traditional educational system to the virtual educational system. Perhaps we find some processes are deducted, modified or added.

##### *2) Information flow for universities in higher education:*

Based on [35], the research reinforces the view that exploring the nature of learning and education in a university enables us to understand how the learning system is applied. In their case, the authors did a detailed review of the process of The Arab Academy for Science, Technology and Maritime Transport (AASTMT) in Egypt. Thus focusing on the essential learning processes at the College of Management and Technology (CMT) of AASTMT. The authors proved it is possible to compare different learning processes in different universities and also in different countries. The same models are proven to be similar and compatible indicating the same learning processes across different institutions. Therefore, the same process and technology improvements may be applicable and equally beneficial.

Fig. 1 is the Second-Cut Process architecture Diagramming (PAD) or the Detailed Process Architecture Diagramming showing the process architecture in Higher Education. The diagram provides an overview of the essential business of the college and enables tracing and query connections between different processes. This model allows visualization of the work flow and makes it possible to detect the possible improvements rooted in the essential processes of the college. A detailed explanation of these processes found in [35].

Fig. 1 case process modelling shows the processes of the Higher education system, the interactions between them and the data flowing from one process to another. It is relatively easy to see that three key processes are essential in this model: 'Handle a Course Curriculum', 'Handle a Lecture', and 'Handle an Assessments/Exams'. In this paper the main focus is on 'Handle a lecture' process. The process is selected as it was seen the core of the educational system for which the remaining processes are associated and serving it as well as a key gap identified in the literature with regards to a fully integrated e-university realization.

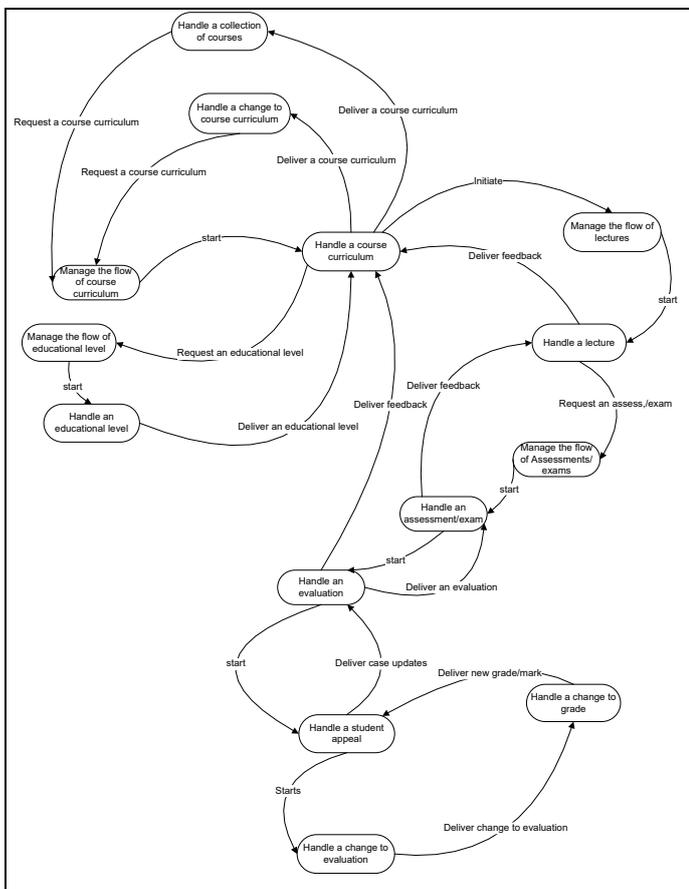


Fig. 1. Detailed PAD for Higher education System (Fady and Abd El Aziz, 2015)

Handle a lecture process is also a good representation to compare the traditional and the virtual learning process as it is the most critical process to be undertaken virtually. The process starts when the new teaching schedule is delivered and the course curriculum is prepared, the instructor then starts teaching and waits for the exams schedule to be delivered. After the process is finished by the end of the semester the instructor is required to provide a feedback about the course to update the course curriculum. A detailed study of this process is key to understanding how this transition can take place.

### III. METHODOLOGY

The research aim is to design a virtual and integrated e-university process model to visualize lecture/lesson delivery as the core process of any e-university process. This process to explore the available technologies and find a system that mirrors much of physical processes into virtual environment. For this to be completed the authors agreed the methodology to follow these defined research objectives.

- 1- To conduct a literature review on existing models for e-university.
- 2- To identify gaps in the literature with regards to key process modeling.

- 3- To model the processes of lecture/lesson delivery of a physical university.
- 4- To model and study the processes of an online lecture/lesson classroom delivery; in this case the team selected the online classroom model of Arden University.
- 5- Validate and compare these processes for completeness, similarities, and differences.
- 6- Make recommendations for improvements and changes.

From the literature review, the authors have been able to complete objective 1 and 2. Further work will be needed to analyze the lesson delivery processes at AASTMT to complete objective 3. For research objective 4, the authors will review the educational processes of Arden University as a case of a blended teaching university with strong leniency to the e-university model. Arden University online courses use Adobe Connect [36]. These processes will be closely examined alongside AASTMT lesson delivery processes for verification and completeness to complete objective 5. Finally for objective 6, the team will make their recommendations for improvements.

### IV. RESEARCH FINDINGS

Using the Role Activity Diagraming (RAD) as the detailed model technique of Riva, the team modeled both the traditional and virtual lecture/lesson delivery processes.

In figure 2, the process 'Handle a lecture' explains the traditional activities that are undertaken in each lecture. The instructor at the beginning has to have the time and place of teaching, then the curriculum is reviewed and updated to represent the correct dates, and the materials needed for teaching are prepared to start teaching. In the classroom the instructor has to take the attendance where the instructor and the students meet physically, the instructor either explains the topic and teaches the students or allows them to discuss it either together or with him/her, or to ask questions or they can also excuse to leave. By the end of the course the instructor needs to provide a feedback about the course that will then be used to change the curriculum.

The instructor receives the dates of the assessments and starts to prepare them, some of the assessments need to be reviewed by the team leader, and after being reviewed the instructor might give them to the students to be answered in the class physically or online. After the assessments are marked, the grades have to be peer reviewed under the team leader's supervision to approve the grades for the instructor to publish them to the students electronically.

In the virtual process according to the method used by Adobe Connect and Arden University we modeled figure 3. The process shows almost similar activities being done as in the traditional process only this time much of these activities are done virtually online.

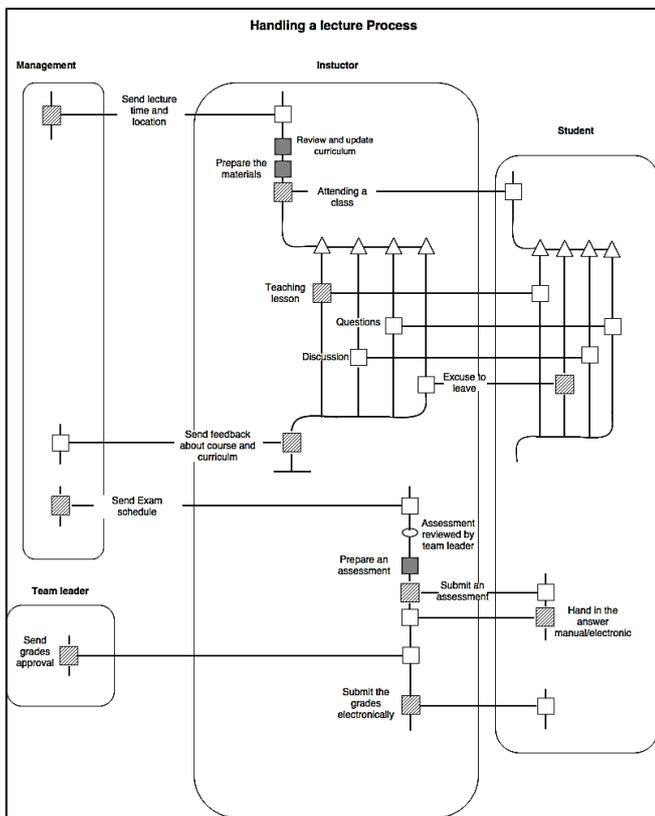


Fig. 2. Handling a lecture at the traditional system

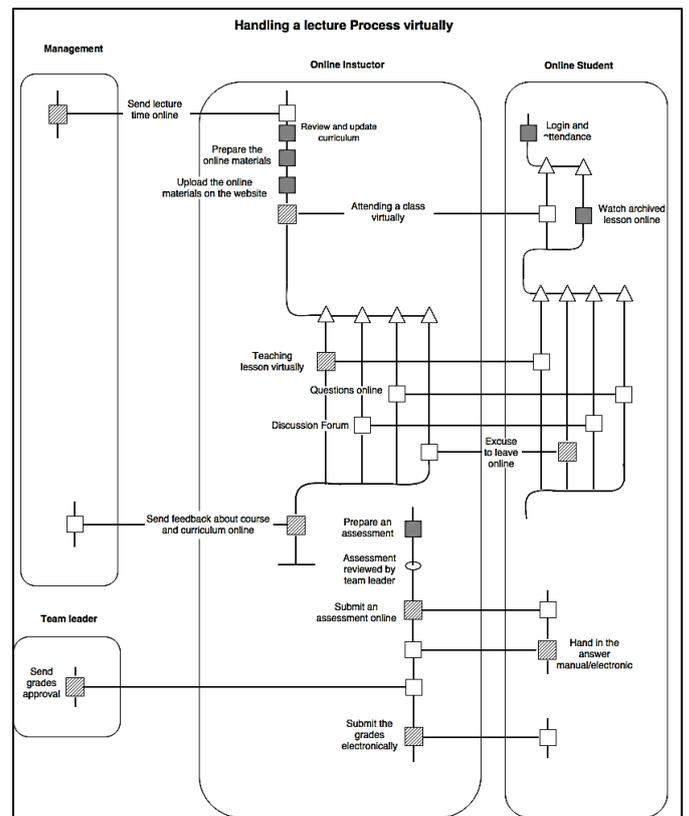


Fig. 3. Handling a lecture at the traditional system

The instructor electronically receives the timing of the lecture but no classroom, he/she prepares all the materials required for teaching including the recordings of the class explanations, and then all the materials are uploaded online to the student. The students and the instructor attend the class virtually, they need to login to the system, the students might attend live classes or retrieve old ones.

During the live class, the instructor either explains or teaches the students virtually. The instructor discusses the topic with the students using forums or answers the students' questions online. Any student can request excuse to leave when they need to do so by pressing on a button that informs the instructor about that.

Students can also press on buttons requesting from the instructor to slow down or speed up while explaining the topic. Other interactivity aspects have been included including clapping, laughing, raising hand to ask questions, and live chat. By the end of the course the instructor delivers a report about the course and recommends changes to take place. The assessments are all done virtually that the students have to answer them electronically to show the instructor that the topic is well understood. Exams are also prepared by instructors and reviewed online before submitting them to the students online. After the grades are approved online they are announced to the students online. There is no schedule for a final exams but there is deadlines for assessments.

## V. REFLECTION AND ANALYSIS:

It is evident from this analysis that much of the processes and interactivity involved in the delivery of lecture/lesson has been successfully simulated online. This fulfills the core process in the move towards a fully integrated e-university concept. What is more, the activities have been enhanced to account to improved support and interactivity for students. Improved interactivity means that students are able to express range of emotions and requests without the pressure of being in the classroom. This could be seen as encouraging to students' interaction in the virtual classroom environment using comparable tools used in virtual social networking. The live nature of the classroom represents the nearest comparable model we can find for physical classroom simulation. In addition, students are also able to revisit in an e-learning format the lecture/lesson at later stage; something many students feel would help them in understanding the lesson further. However, the virtual environment means instructors cannot be sure if the person attending is in fact present. Beyond the login, there is no evidence that the instructor can verify if the students are paying attention to the lesson or say being distracted by their phones. Missing the face-to-face interactivity would suggest that instructors will miss on key body language for students who are too shy to ask for further explanations. Another key outcome of this analysis shows that the process is taking into account that lessons/lectures need to incorporate a blended method of teaching that still resembles in much of it the traditional

teaching methods. Evidently with process such as these presented in the Adobe Connect for Arden University, much of the traditional pedagogies can still be applied in the virtual environment.

## VI. CONCLUSION AND FURTHER RESEARCH

The aim of this paper is to look at the key corner stone in the process of moving towards e-universities. Evidently this review shows that the process towards full e-university is being achieved but more work needs to be done for the other processes. Other university processes need to be investigated to ensure that the concept of a fully integrated online e-university experience is reachable and successful. The next two key processes to be investigated are the 'Handle of Curriculum' and 'Handle of Assessments'. In addition to this, lessons learned from the failure of the UKeU need to be reviewed to ensure these factors are addressed. Crucial to all this is the concept of trust and validity of the process. Further research is needed to compare the outcome from classes, modules, and courses taught in physical and virtual moods of studies. Will students and employers give the same weight to qualifications earned via e-university degree as they do from traditional university degree? What will be key to the trust in this process? These presents further research the team would recommend.

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