Interactive Materials Development using the Rapid e-Learning Method - Examples from the Field
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Abstract
In this paper we present the rapid e-learning method that allows educators, practitioners and e-learning professionals to quickly develop curriculum-related interactive learning materials that they can use in classroom environment, in an online learning environment or in other forms of e-learning. This technique does not need advanced ICT skills development and training and shortens considerably the development time of interactive resources if these were to be developed by a core group of developers. This technique has a number of benefits, both at individual practice or at systemic levels. For example, in Mauritius the Sankore project was implemented a few years ago with the support of the French and British government that embarked on equipping primary schools with one interactive whiteboard, such classroom commonly referred to as the Sankore classroom. At the same time, tablets were delivered in secondary schools to students and teachers alike and the tablet PC project is widely described today as a failure, while the Sankore project has been criticized by many educators for issues like faulty whiteboards, lack of technical support, and lack of resources covering the curriculum. The paradox with technology implementation in schools is that the lifespan of technological gadgets is quite short and obsolescence is a major constraint as this requires constant investment resulting very often in unsatisfactory outcomes. The idea we promote in this paper is to decentralize content development process through empowerment of educators to develop and share their own resources as open educational resources. This will result in an exponential increase of the rate of development and release of resources to the schools to ensure maximum use of digital resources, using the existing equipment such as Interactive Whiteboards and Tablets. We provide field examples to illustrate how the technique has been applied in different educational contexts.

Introduction
There’s a rapid growth in e-learning as the majority of educational institutions have already established the web-based systems to offer online courses. (Harrati et al., 2016). However, Parlakkilic (2015) noticed a disadvantage of this system - the time dedicated and cost are very high. eLearning which is also referred to as online learning, blended-learning and web based learning, is the integration of technology in learning, where educators and presenters use innovative means to enhance their teaching practices. According to Schneider (2014), eLearning encompasses more concepts like collaboration and online tutoring, electronic books, automated assessment, computer-based training which are used to support and improve education through the use of technology. However, eLearning has evolved in time especially with the emergence of new technologies and it is not simply considered as a replacement of printed materials. Nowadays, the advent of new technologies have brought eLearning to a new dimension which has not only evolved from printed education manuals to multimedia learning resources but has also involved new emerging trends like virtual reality, augmented reality, simulations and educational games, tele-teaching through videos and 3D environments in learning.

eLearning at the University of Mauritius was initiated during the year 1993 by the Centre for Distance Learning (CDL), where the strategy was to take large cohorts of face-to-face modules and convert them into distance education manuals. Over the years, it has been noticed that the distance education manuals served only as supplement notes to the learners who in turn print these for learning. Similarly, the university could not increase its enrolment rate. Since 2003, the Virtual Centre for Innovative and Lifelong Learning (VCILT) introduced a better strategy of reworking the face-to-face courses into self-learning materials, with a view to increase learner flexibility and convenience for
learning (Santally, 2004; Santally and Senteni, 2005a, 2005b; Santally & Raverdy, 2006; Rughooputh & Santally, 2009; Santally & al., 2012).

It has recently been focusing on the development of interactive learning materials through a customised rapid e-learning methodology. In this paper we present the rapid e-learning method that allows academics, educators and education technologist to quickly develop curriculum-related interactive learning materials that they can use in different contexts such as classroom environment, online learning platforms, professional self-instructional training including informal learning contexts. The methodology has been developed after initial experimentation using text-to-speech technology to generate voice-over-powerpoint resources that were delivered to students as MP4 and YouTube videos. The methodology has been continuously refined and the Centre has developed a way of effectively applying the methodology to deal with large projects through a production chain.

The Rapid eLearning Concept

Vries and Bersin (2004) observed that institutions are building e-learning content using rapid approaches, known as “rapid e-learning”. As a result, the institutions are developing the e-learning content at a rapid pace and a cheaper price as to potential traditional e-learning. According to West (2007), rapid e-learning tackles both “time and cost” issues by the use of innovative tools to move from elements of e-learning development. She stated that developing learning contents through rapid e-learning would take weeks rather than months. Parlakkilic (2014) further extended that the course contents can be developed within four weeks as it has a short shelf-life and its learning duration is generally less than twenty minutes. According to the latter, the rapid e-learning is cheap and uses simple authoring tools to create contents.

Kineo (2012) postulated that they wanted to pursue with rapid e-learning model in the education sector. All authoring tools that educators use to build their online courses, the possibility of assimilating many resources, despite they comprises of different formats, into one directly feasible in a virtual learning environment (VLE) are examples that can be represented by rapid e-learning. (Piave, 2008).

Dunkelberg (2011) depicted that rapid e-learning tools have been designed to simplify and to be combined with desktop applications to produce pedagogical content and e-learning courses. The Health E-Learning and Media Team (2013) listed some tools designed to allow development of e-learning materials namely,

- **PowerPoint to Web converters**: They can be used to create animations in sequences, sounds and narrations can be added, as well as providing control over the slides;
- **E-learning Course Platform**: for example Moodle, which can be used to upload courses contents, to add users and give them access to the courses;
- **Web editing tools**: an example for this tool is HTML, which allows and simplifies the user’s task to build interactive websites rapidly.

Furthermore, there exist other professional and proprietary authoring tools such as Articulate Storyline, or iSpring which enable the user to easily create courses, quizzes and add media-rich interfaces to e-learning content. Microsoft has recently launched the Office Mix which is an all-integrated software which can easily be published into interactive self-instructional materials including MOOC (Massive Open Online Courses) style courses.

Piave (2008) discussed that rapid e-learning tools is best suitable to the need of developing complicated resources, often published as SCORM-compliant learning materials, which can lift students’ level of understanding and clarifying principles, ideas in a convenient way. Rapid e-Learning tools also respond to the need of an eco-friendly scheme to didactics, permitting e-learners in charge of multimedia content creation, to act as a media education activity in a particular learning
path (Calvani, 2001); and probably evading a passive method to the utilization of multimedia, known as technological hypertrophy (Postman, 1979).

**Overview of the Rapid e-Learning Method at the University of Mauritius**

The rapid eLearning method is a simple method in its own, that takes classic traditional material and converts it to a digital format using sound instructional design techniques. Based on the intended outcome, there can be different methodologies used to provide a rapid e-learning course content. The methodologies which is used for this project is as follows.

![Rapid eLearning Process @ the University of Mauritius](image)

**Figure 1 : The Rapid eLearning Process @ the University of Mauritius**

Rapid E-Learning is an approach which merges important communication with the access to information into a pedagogical and challenging learning community. To achieve the desired outcome in the least possible time, it is important to divide the different procedures into separate steps. Referring to figure 1, there are a number of steps which leads to quick-in-time course content with the pedagogical aspect.

**Step 1 - Raw Material**

Every course is based on textual content. This content is mainly raw pieces of information which generally support the course, also known as Raw Material. An effective content is one where the information is presented using a pedagogical approach.

![illustrating on what consist of raw material](image)

**Figure 2 : illustrating on what consist of raw material**
**Step 2 & 3 - Analyse Subject & Extract Relevant Information**

In the process of shaping the raw material into a pedagogical structure, it is important to analyse the raw material. Analysing the material helps to understand the course/content before designing it. This essentially consists of text analysis and deconstruction to represent it in a lecture format. Once the subject is analyzed and understood, the key ideas embedded in the text are focused upon. This further refines the raw material leading into an easy-to-understand media-rich content. Differentiating the key elements paces the process of designing the content.

![Figure 3: Analysing the subject and extracting relevant information](image)

**Step 4 & 5 - Design the resource & add supporting elements**

This section focuses mainly on the pedagogical element of the content which are represented by ideas, not isolated bits of information. Reaching this stage the content goes to different level of filtration, first analyzing the subject and then the key elements. These key elements are used to design the course. While working with the key element, if they are represented by an image they are often replaced by one. The images and the key elements are then combined together to support the content. An effective design is the backbone in rapid e-learning. Design with easy-to-understand approach often helps the user to understand the course content faster than the traditional style, which is only words and no images. Mayer (2002) has stated that “the case for multimedia rests in the premise that learners can better understand an explanation when it is presented in words and pictures than when it is presented in words alone”.

**Step 6 - Audio Integration**

ASHA (1997) defines speech as the verbal means of communicating and consists of articulating voice and fluency. Speech is another aspect which supports rapid e-learning, helping the users to understand the concept rapidly. When designing the content there are some elements which have to be spoken instead of read. In this stage of speech, these contents are converted from text-to-speech.
Step 7 - Synchronisation

Mayer (2002) postulated that, “In nine of nine tests, learners who received text and illustrations, or narration and animation, performed better on transfer tests than did learners who received text alone or narration alone.” At this stage of course designing, we have the key elements designed and synced with speech to support the content. Synchronizing the text with speech will help the user to build a connection between them, leading to faster understanding of the course content.

![Figure 4: Synchronisation process](image)

Step 8 - Branching

A rapid e-learning interactive material is incomplete without branching. Branching is the stage which supports the pedagogical element of the content, allowing the user to navigate as per the requirement of the course. In this stage the slides are internally branched to create a flow in the course. Generally branching is carried out after step seven, Synchronisation, but it can be carried out after step four and five ‘Design the resource & Add Supporting Elements’.

![Figure 5: Slide branching process](image)

Step 9 - Quality Assurance

Main purpose of rapid e-learning is to deliver a course content in least possible time. With the help of the previous steps, that goal can easily be achieved. Before publishing the content, it is vital to go through the whole content, to identify any mistakes or further changes. The quality assurance process is an essential foundation for verifying and reviewing the design and the illustrations used to ensure that the necessary standards are being maintained.
Step 10 - Publish

The entire course is built up in an organized way with text and images that have been synchronized seamlessly with sound. The whole process is then looked for any further modifications to be done. The final process is publishing the content in a way that can easily be delivered to diverse users.

![Publishing the resource in multiple formats](image)

**Pedagogical Approaches supported by Rapid eLearning Method**

Instructional design is generally referred to as the systematic process where learning and curriculum materials that have been developed, are being organised and structured using effective pedagogical approaches that will enhance the transfer of knowledge. There are different kinds of pedagogies and it varies depending on the digital environment they are being implemented as well as the target audience's needs. At the University of Mauritius, these pedagogical approaches have been effectively put into practice using the Content-Oriented Modeling and the Scenario-based Modeling. There is technically no big difference between these 2 modeling techniques since the base of each is to take the textual resource which is in a raw format and re-work it into self-learning materials. However, both models have their own targeted audience, where they fit in for effective transfer of knowledge.

- **Content-Oriented Models**

  The content-oriented model is content-focused which is structured using different concepts and it targets those learners who already have some academic background. Basically, this model focuses on working on different styles of presenting the information, repurposing learning materials into intuitive and user friendly format and it targets those professionals who require quick on-job training or students. They can be in the following format:

  **Video Lectures - supported by audio speech**

  Video lectures tend to replicate to some extent face-to-face lecture delivery in a classroom to provide a feel of the presence of a ‘teacher’ who is leading the content delivery process. It is a mix of multimedia animation elements to recreate the Powerpoint style lectures as illustrated by the figure below.
**e-Books**

These are the digital versions of traditional white and black instructional manuals in interactive format. The digital books (e-books) can embed video illustrations, graphics and even small audio files, as well as interactive exercises to address a variety of student learning preferences/styles in one resource. However the amount of text supersedes the other elements in this model.

**Interactive Walkthroughs**

An interactive walkthrough is mainly a form of step-by-step tutorial in visual format (with the possibility of voice-over) using a simulation approach to illustrate processes, or ‘how to’ functions including the use of software for example. In this model, screen-captures and annotations play an important role. The knowledge capture process is also important from the point of view of an expert user.
Scenario-based Modeling - focuses on creating a story to make learners learn.

The rapid e-Learning methodology can also be used to address critics of the traditional e-learning approaches that argue on the fact that the classic e-learning approach (Santally et al., 2012), cannot address objectives of outcomes-based pedagogies. Functionalities in professional rapid e-learning authoring tools allow for content to be conceived in terms of scenarios and role-playing to put the learner in virtual but authentic learning contexts.

Examples from the field applications of the Rapid e-Learning Method

The traditional eLearning approach used for online courses is often based on basic HTML pages design whereby contents are being broken down into topics and subtopics. The e-book model also follows a similar approach with supporting elements to ease learning processes. However, the rapid eLearning method, is a technique which has a simple lifecycle model and which when being implemented in a production chain style, can allow many people to work on different phases of one project, at a rapid pace. Thus, making the delivery of one project being achievable rapidly. There are a few projects and initiatives that have been achieved when applying the rapid e-learning methodology at the University of Mauritius. Before we embark on field applications of the rapid e-learning methodology, it is worth describing its potential to drive digitization of school curricula if interactive content development process is decentralized to educators rather than being done in a central way by a few developers. In the local Mauritian education sector, the University of Mauritius had been supported by Microsoft locally to disseminate the technique in capacity building workshops...
to educators. These trainings took the form of 2-3 days intensive workshops where educators were introduced to the technique so that they build and share their own learning resources. These resources will be pedagogically rich in variety and conceived from educator’s field experiences, and they would be more willing to use their own materials. The time for the resources to be developed and used in the classroom will also be decreased which is positive given the short shelf life of ICTs.

**Informal Learning Contexts**

*Lifelong Learning for Farmers in Agriculture*

The Lifelong Learning for Farmers (L3F) project is an initiative of the Commonwealth of Learning, which has developed a model “linking the capacity building of farming community particularly women through ODL and flexible and blended learning and linked the process with social and financial capital”. The Commonwealth of Learning (COL) through this its agreement with the relevant authorities in Mauritius aims to support the Food and Agricultural Research Council (FARC) through its Agricultural Research and Extension Unit (AREU) now known as FAREI, to develop its capacity in e-learning using multimedia based Open Distance Learning (ODL) materials and incorporate different delivery methods, and using mobile phone potential as an e-learning interface among the farming community. 14 ODL short courses were repurposed and published on CD/HTML format using the Rapid e-Learning Methodology by the staff of FAREI and these were distributed and disseminated to farmers through the existing channels of the FAREI.

*Women Empowerment - “Legal Rights of Women”*

This project was funded by the Commonwealth of Learning in collaboration with the Ministry of Gender Equality to develop a set of CD-ROMs on the “Legal Rights of Women’ to sensitize both women and men especially from deprived areas and poor communities throughout the country. It was conceived for people with low level of education and used mainly illustrations and voice-over in the Creole Language for maximum impact. Officials of the Ministry were also trained to use the technique.

*Mass Literacy Training - the B.ABA TV project*

B.ABA TV is an ambitious project undertaken to combat illiteracy over the African continent through an Interactive TV program (transmedia), based on the fun learning concept. The project is conceived and piloted by Stephane Gaultier, based in France, with the University of Mauritius and other key stakeholders as partners. More information on the project can be found at the project’s website [http://babatv.org/](http://babatv.org/)

**Formal Educational Contexts**

*Online Courses at University Level*

The rapid e-learning method is equally applicable in higher education context for formal University module offered at undergraduate and postgraduate levels. At the University of Mauritius the technique has been applied to develop a set of resources that were published as YouTube videos. The technique has also been used in consultancy projects to develop resources for Universities in the Middle-East and on programmes offered in collaboration with Commonwealth of Learning.

**Professional Development Contexts**

*Specialised Professional Training*

Rapid e-Learning can be used in professional context where employees need quick and short workplace training, for example on a new product to be launched. It is also useful in training of
regulated jobs such as in airports (e.g. security agent) where the preferred approach would be a scenario-based training to optimize learning outcomes. E-learning courses on customer service, or on specialized topics like professional legal training for legal assistants are examples where the technique has been successfully applied.

Discussion

In Mauritius the Sankore project was implemented a few years ago with the support of the French and British government that embarked on equipping primary schools with one interactive whiteboard, such classroom commonly referred to as the Sankore classroom. At the same time, tablets were delivered in secondary schools to students and teachers alike and the tablet PC project is widely described today as a failure, while the Sankore project has been criticized by many educators for issues like faulty whiteboards, lack of technical support, and lack of resources covering the curriculum (Jugee & Santally, 2016). The paradox with technology implementation in schools is that the lifespan of technological gadgets is quite short and obsolescence is a major constraint as this requires constant investment resulting very often in unsatisfactory outcomes. Decentralising the process of interactive materials development by empowering educators to adopt this simple methodology can help to achieve the digitization of curricula at a faster pace.

Organisations nowadays have become learning enterprises and the focus is more on building the human capital on a continuous basis to ensure the employees remain productive, efficient with up-to-date knowledge and skills to maintain competitive edge. There is furthermore a need to balance widespread access to the internet and social media by employees, while leveraging on the potential of ICTs through e-learning and self-instructional approaches. Rapid e-Learning techniques provide enterprises with this kind of flexibility and possibility to create high quality learning materials in a shorter time frame and to train their employees on products and services that have relatively short shelf-life.

On the other hand, rapid e-learning bring an added value dimension in the field of distance education where there is the possibility to recreate traditional lectures in a comparable form disseminated online and which can address a wider range of learning preferences. Powerpoint presentations can easily be transformed in interactive animated materials with voice-over, thereby providing the feel of instructor led classrooms, and converted to multiple formats that suit different types of electronic devices (Rughooputh & Santally 2009). The Youtube channel where the learning resources of the University of Mauritius are disseminated, has about 100 videos, and approximately 1500 subscribers for a total of about 400k views since 2010. These are available as open resources which can be easily embedded by other educators and institutions in their own e-learning platform while academics of the University can also do same with available videos from other providers. This allows for an exponential growth in the availability of e-learning resources, developed using a variety of techniques and made available under a community based sharing model.

Conclusion

The concept of rapid e-learning is in itself not new, but there are variants of the approach, and at the University of Mauritius, such a method has been adopted and refined over time in terms of its conception and application. The idea was to keep improving the methodology in terms of efficiency of practice, and quality of output of learning materials as well as the pedagogical approaches. We have provided an expose of the method and described authentic examples in different contexts where the method has been applied, and experiences from the field have been taken into account to continuously improving our approach. Adoption of rapid e-learning in educational institutions can prove to be beneficial to the improvement of their overall teaching and learning models while also provide a lifeline for compromised and badly planned projects such as the tablet-pc initiative in Mauritius.
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