

# Gap between Theory and Practice: Human Factors in Designing and Developing Effective eLearning Materials for a Structured Syllabus

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## **Abstract**

*One of the most important factors in eLearning material development is the alignment of material according to the curriculum on which the learner will be assessed for the certification. The visual appearance and the interactivity have to be designed in a way which supports the smooth propagation in the syllabus. In a practical environment, the syllabus is usually prepared by one party or one person known as the subject matter expert (SME) and the development of learning content is managed by the Instructional Designer (ID). Theoretically, ID is not necessary to be a subject matter expert and he/she is supposed to develop a learner-centric material based on the syllabus and the subject content provided by the SME. Without thorough knowledge of the subject matter, it is very hard to develop material, which satisfies the SME. This knowledge gap slows down the development progress of ID and further SME expects ID to learn or find out detail subject content rather than directly specifying them. This shows that it is hard to build the co-ownership and collaboration between these two parties if ID doesn't have an acceptable level of knowledge in the subject.*

*In the process of eLearning content development, ID is a leader of those, who support for his/her eLearning material development like, graphic designers, animators and system administrators. These parties do not interact with the SME and they hardly get a complete picture of what they are producing. In practice, this leads to some miscommunications and disappointments among all stakeholders. As a result, poor quality and low interaction material will be delivered and SME may not be happy about the content.*

*This experience is based on developing eLearning material for a distance education program called BIT ([www.bit.lk](http://www.bit.lk)) and the eLearning courses are hosted at <http://lms.bit.lk>. In this paper, we are presenting the techniques we have used to reduce the gap between all stakeholders in the development of eLearning material. The hybrid processes applied are illustrated in diagrams and explained for comprehensibility and applicability of anyone interested in developing successful eLearning materials.*

*Keywords: ISD (Instructional System Design), SME (Subject Matter Expert), ID (Instructional Designer), ADDIE Model, eLearning content production process*

## 1. Introduction

Instructional Designers (IDs) design eLearning materials based on an Instructional System Design (ISD) Model. There is a list of tasks to be completed at each phase of an ISD Model. Those tasks are assigned to the members of the group considering the quality and the efficiency of the work. But in practice, it is impossible to get some of those tasks done from the appropriate group members as stated in theories. To make everything done according to the schedule, we need to declare our own process model for the instructional system design and development.

Instructional content design should always follow the sequence of learning content listed in the curriculum (Hewagamage, Weerasinghe and Wickramanayake, 2007). So, it is wise to have another look at the curriculum and see whether we need to have a curriculum change before starting the eLearning content production. When we have lots of courses in a learning programme, the curricula of all the courses should be produced by following a template guideline to maintain the consistency. We should make the curricula accessible for the learners in the online learning environment. The development of a curriculum should also be done according to a process model to result in a highly structured syllabus with a well defined course goal, learning objectives and content to meet the learning objectives.

The eLearning content production at the eLearning Centre of the University of Colombo School of Computing begins from the preparation of the curriculum. Thus, here we use the term eLearning content production for the work we do from curriculum development to eLearning content deployment. In this paper we explain the processes we apply in the eLearning

content production and the steps we have taken to minimise the common barriers.

## 2. ADDIE Model and Other ISD Models

Instructional System Design (ISD) Model describes a systematic approach to produce any type of instructional material. There are several ISD Models in practice namely, ADDIE, Dick and Carey, Kemp and ASSURE Model. According to McGriff's (2001) comparison of ISD Models, there are three major phases in all the models; Analysis, Development and Evaluation. Further he emphasizes that ADDIE Model is the only one model which describes Design and Implementation phases clearly.

The Design phase is as important as Analysis phase in any eLearning content production process. Implementation of eLearning is also important as it prepares the learning environment for the learner. Because of this nature, we have adopted ADDIE Model with modifications according to our requirement.

The ADDIE Model has five phases as Analysis, Design, Development, Implementation and Evaluation. Each one of those phases has several iterative steps which must be followed until a satisfactory output is achieved. The steps are arranged in an order based on our practical experience.

We have used the questions published by Strickland (2001) to determine the steps to be followed in the Analysis phase. They are, defining the need, analyzing the audience, defining the goals and objectives, selecting a delivery method, identifying the existing constraints, selecting a method of evaluation and preparing the time plan.

The second phase of the ADDIE Model is Design, where we further analyze the content to align them with the learning

objectives, design Course Flow Charts, determine the content presentation methods, design the learning activities, create storyboards, design templates and write scripts for narrations. By looking at the course flow charts and storyboards we select the existing reusable content and prepare design documents with detail information for the medial elements to be created. Finally, the task of creating media elements is assigned to the appropriate content developers.

The required animations, images, video and audio content are created or modified by animators, graphic designers, audio-video producers respectively. The course content with text is created by instructional designers using the pre-designed course-page templates. Thus, in our eLearning content production, the instructional designers work as software engineers as well.

Once all the materials are developed we implement the system by preparing the online learning environment, providing the student support services, providing necessary information to the facilitators and by preparing the learners for the online learning environment.

The last phase of the ADDIE Model is Evaluation. This contains two components; Formative Evaluation and Summative Evaluation of the course material. Formative Evaluation should be done throughout the whole content production process to check whether the objectives of each and every task are achieved.

The Summative Evaluation is the overall course evaluation and the major part of it should be done with the target learners. So, the Summative Evaluation phase of the ADDIE Model should be done in a separate process. Therefore, in this eLearning content production process we do not consider the

Summative Evaluation phase of the ADDIE Model.

### **3. Major Challenges Faced by the ID**

The challenges faced by the ID in acquiring the final product from the design plan are important to be considered to end up with a successful eLearning material. The ID needs to have all relevant content of the course on time in order to analyse the learning content to refine the learning objectives and determine whether there are missing content or unnecessary content according to the syllabus. But sometimes, the content that we have identified earlier as unnecessary according to the syllabus may be considered as important later and that will result a syllabus modification. This phenomenon emphasises that it is essential to acquire all required subject content from the SME on time.

ID needs to go through all the content of the course and identify the most important information and detail information. The most important content should be placed on top of the user interface and the detail information may be placed on the bottom layers as popup pages or message boxes in the eLearning material. But it is hard to decide which content is more important and which is less important by looking at the course goal and learning objectives.

ID is supposed to create learning activities to achieve constructive alignment. It is obvious that SME has more experience in teaching the subject content than the ID. SME knows which content areas are difficult to the learners and which content can be easily absorbed by them. But in reality in the eLearning content production process, the ID is designing the eLearning activities to help the learner achieve the learning objectives.

Making content developers thoroughly understand the requirements of the ID is another challenge faced in the eLearning content production process. If SME changes his/her idea later and requests to have a different activity for an already designed one, then the ID needs to redo the whole process of preparing design documents and the content developers need to recreate the media content.

The eLearning content production team members always work with fixed time schedules and therefore they cannot wait till the other one finishes the dependent-tasks. We need to find alternative processes to move the production process on schedule and finish the work on time.

#### **4. Theories to overcome the Challenges in eLearning Content Production**

Even though it says “ID needs to know everything to give learners opportunities to use new skills in natural, authentic settings to provide meaningful opportunities for learners/employees to use their newly acquired knowledge/skill.”(Keller, 1999), an ID has lesser teaching experience than that of the SME. Also SME is the one who knows the difficult areas of the learning content, which examples are well suitable for the learner to easily understand the new concepts in the course.

Nelson, Magliano & Sherman ( 1988: 32) say that “One of the designer’s main jobs is to select, sequence, synthesize and summarize the content for instructional purposes.” But no one can say that ID is responsible for finding the suitable content to fill the missing content according to the syllabus. In our eLearning content production work we found that ID can also support the SME by finding good books as recommended text, web resources, and even by preparing teaching materials.

Wallington (1981) suggests that the designer requires the ability to extract and assimilate chunks of information and then work them into a logical framework as defined by the SME. But, this is not applicable in our practical environment. When SME is too busy with lots of other duties, IDs cannot wait for a logical framework or even for all the content.

Considering all these challenges faced by an ID in designing eLearning content, we have created process maps to overcome the problems and to lead and guide the production process smoothly.

### **5. eLearning Content Production Process**

Our eLearning content production process has two distinct stages as Curriculum Development Process and eLearning Content Development Process.

#### **5.1. Curriculum Development Process**

It is essential to do a curriculum revision in order to prepare the content for the online delivery (Hewagamage, K.P.H., Wickramanayake G. N., Weerasinghe T.A., & Mozelius, P.(2007).

#### **5.2.eLearning Content Development Process**

eLearning content development process includes the Analysis, Design, Development, Implementation and Deployment of eLearning material. The processes from the Analysis to the Confirmation of Storyboards for Main User Interfaces are illustrated in the Figure 1 and rest is illustrated in the Figure 2.

## 6. Conclusion

The well known ADDIE model is modified to suit with our requirements and to overcome the identified challenges. Process diagrams for eLearning content production are drawn to make everyone understand and apply the process to produce eLearning content.

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## eLearning Content Development Process Diagram - Part 1

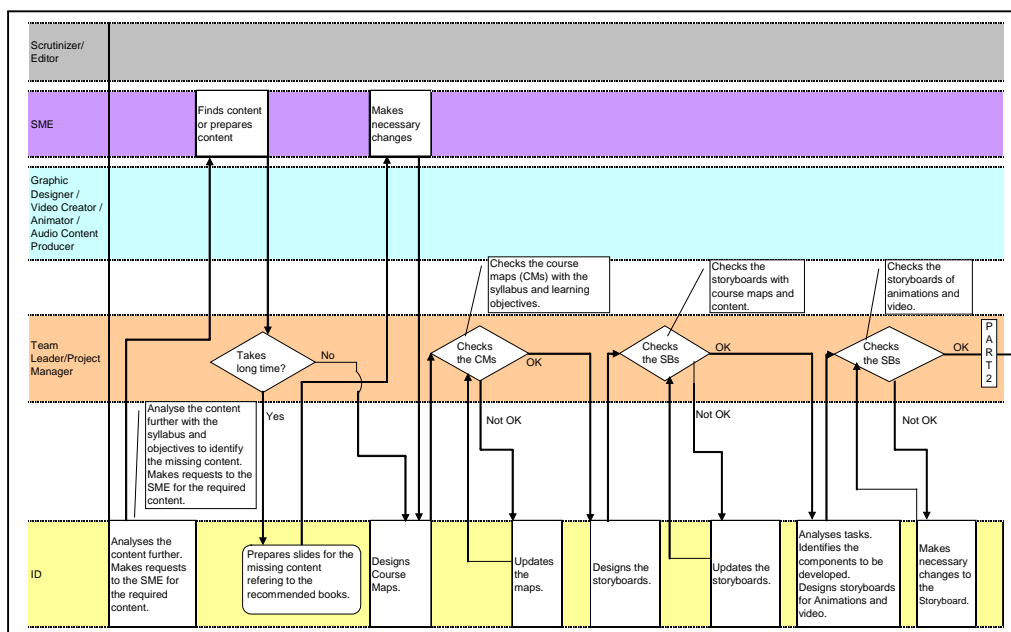


Figure 1

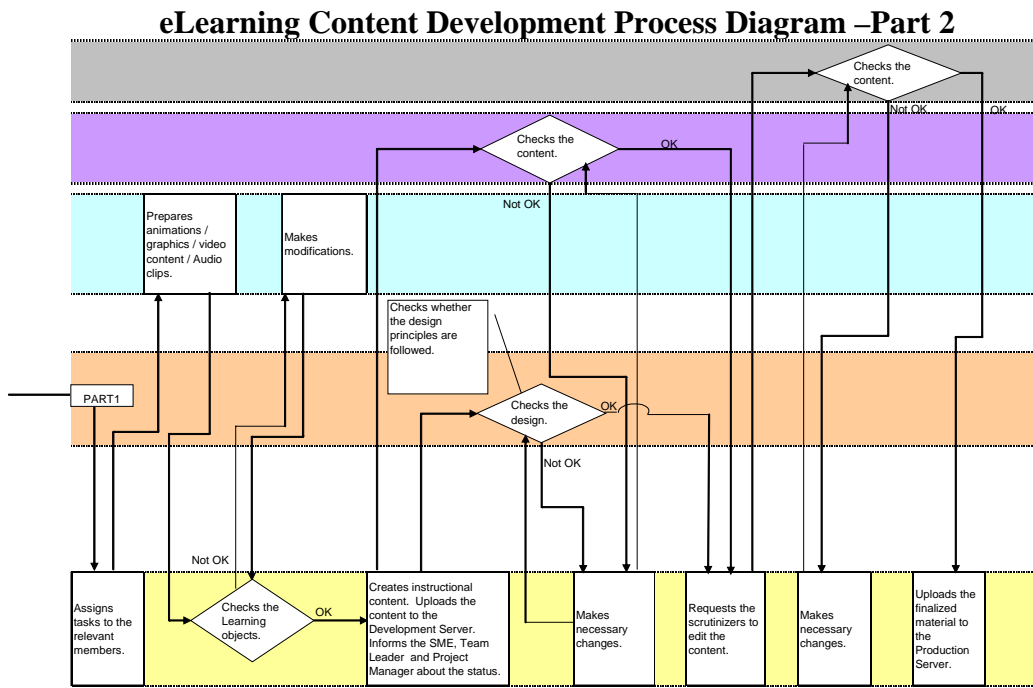


Figure 2