E-learning Shareable Content Objects: The Trainee Teacher Does It

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ABSTRACT

The 21st Century teacher is required to augment and connect learning via innovative digital methodologies as digital technology can excite learners and even provide an engaging alternative *vis-à-vis* the conventional methodologies. This is a statement often uttered in education circles. The questions before us are: are our teachers inclined towards technology? Are they aware of a variety of technological tools that can be embedded in teaching? Are they be able to create their own learning objects? Unfortunately, largely 'NOT'. This paper presents a classroom adventure wherein, B.Ed. teacher trainees created digital objects in the form a Shareable Content Objects (SCO).

Keywords: B.Ed. teacher, digital technology, E-learning

E-Learning

While e-learning over time has seen several definitions being coined to explain and illustrate it, the basic idea that remains unchanged is that, 'e-learning' is an umbrella term that is characterized by a mix of technological tools, electronic devices, variety of learning environments (classroom and beyond), variety of content formats, interaction between learners …In short, e-learning has evolved into diversified forms and applications that have infiltrated every sphere not leaving our classrooms as exceptions. With a plethora of e-learning technologies emerging at such a tremendous speed, we are left with a crucial decision, 'take it' or 'leave it'.

Shareable Content Objects in e-learning

A Shareable Content Object (SCO) is a self-contained launchable learning object that communicates with the run-time environment that launched it. The SCO contains a collection of content related ideas, practice items and assessment types based on integrated learning objectives.

Prominent characteristics of a SCO are:

❐ Can occur in two styles namely; as a single web page or several web pages. Several web pages constitute a collection of web pages.

❐ Is a self-contained learning resource that is re-usable

❐ May be launched in a standalone web window, or in a frame in a HTML frameset.

In the present study, the SCO was developed using the Learner Content Development System (LCDS) a product of Microsoft.

Learner Content Development System (LCDS)

Learning Content Development System (LCDS) by Microsoft is a free tool that enables building of high-quality, interactive, online courses and Microsoft Silverlight Learning Snacks. The LCDS allows generation of highly customized content, interactive activities, quizzes, games, assessments, animations, demos and other multimedia.

(a) How does LCDS assist in authoring a SCO?

❒ One can choose from a wide variety of in-built templates for authoring rich e-learning content and Silverlight-based interactive components.

❒ Upload or attach existing content (media files). LCDS supports multiple file formats.

❒ Develop course structure and easily rearrange it at any time

❒ Deliver web content that conforms to SCORM 1.2, and which can be hosted in a learning management system.

(B) The LCDS Interface
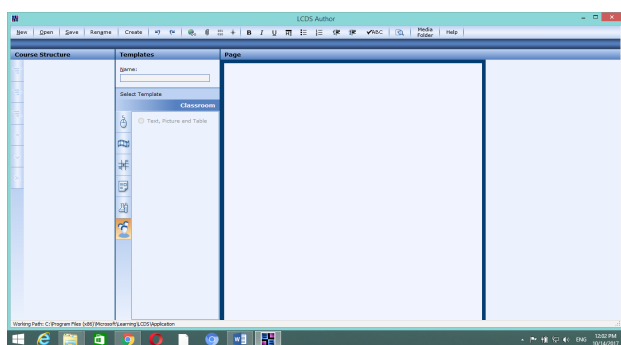
The LCDS interface comprises three panes. They are:

❒ **Content Structure:** is the extreme left pane that shows the course structure with the table of contents, lessons and topics.

❒ **Templates:** are the different formats in which content can be presented. The different content templates are as follows:

⊙ **Interact** provides different types of interactivity such as drag and drop, adventure activity, sequence activity …

⊙ **Watch** offers templates for animations and demonstrations.

⊙ **Play** throws in fun for learning through tile games, sort games.

⊙ **Read** lets you create content with text, tables and pictures—as well as interactive quizzes.

⊙ **Try** provides hands-on simulations in which the user can move around the screen of the actual software program.

⊙ **Classroom** combines text, pictures, tables and other elements in one comprehensive format.

❒ Page: the page template displays the layout of the content in a chosen template.

(C) Designing a Course

Designing a SCO with LCDS does not require programming skills. All that matters is creative ideas, knowledge to create and edit videos, sound files and other media elements. Interactive learning materials is generated by fitting variety of media elements into the pre-designed templates that LCDS offers.

Rationale for the Study

The rationale for the study is perceived from two notions namely; the learner and the teacher. The 21st century learner is a digital native in the words of Marc Prensky (2001) and that web 2.0 e-learning tools are transformational in their learning. On the other hand, the immigrant (non-digital native) teacher is nonplussed. Everyone says use technology in the classroom, but, what technology? The war today is between the immigrant teacher who harnesses technology and the immigrant teacher who cares less for technology. If we shift our attention for a moment on the upcoming brigade of teachers, they can be trained for a difference. But, it is interesting to how the physiognomy of the modern ambitious learner and how training teachers to create digital objects would benefit all.

The International Education Advisory Board in a white paper that was released in 2008, strongly argues that the 21st century learner uses technology to interface with the world around them. This means that they:

❒ Think differently – we as an immigrant generation (into the digital world) will first try to understand how a new technology works, but this generation does not marvel at it; they simply accept technology, adapt to it and use it.

❒ Take control – they prefer to use technology to communicate with the world around them, entertain themselves using technology and learn/study through technology. They are not limited to linear searches in encyclopedias, instead they are in cyber space for information.

❒ Like choice: use a variety of technologies to complete tasks in new and creative ways.

❒ Group-oriented and social: they are collaborative, sharing with other socially, they are a part of virtual communities and social sites.

❑ They are risk taking and more importantly they value time.

Training trainee teachers to design e-learning Shareable Content Objects (SCOs) exposes them to not only design, develop and finish a digital e-learning module but primarily to:

❑ Develop ability to reflect, problem solve, embed a variety of open source and free software

❑ Promote a practice whereby, trainees learn to translate their own creative ideas into digital materials.

❑ Customize the learning material relevant to the ecological reality

❑ Promote leadership so that other practitioners may be inspired

A trainee who is skilled in creating digital learning objects is sufficient enough to transform the way learners learn.

Objectives of the Study

1. To develop e-learning sharable content objects (SCO) in teams (4 teacher trainees per team) across different school subjects

2. To measure the students reaction (attitude) towards developing the SCO

3. To analyze students reaction towards the use of e-learning

Protocol Employed in Designing the Shareable Content Object (SCO)

The ADDIE e-learning development model was engaged to design the SCO across school subjects. The **workflow** followed in creating the SCO can be understood through the sequence of steps presented below.

WORKFLOW in Designing the SCO

Analysis

❑ Needs analysis: our instructional approach and practice needs an overhaul. Being 21st century teacher trainees, they are expected to be '*creators'* of digital learning materials rather than perennial '*consumers'* while transacting the school syllabi.

❑ Target audience analysis: the learner characteristics (of school students) that were looked at were; locality, access to technology, language ability and previous schema, computer skills and amount of time available.

❑ Topic and task analysis:

⊙ The trainee-teachers were encouraged to form their own teams comprising not more than four members each. It was mandatory that they belonged to the same teaching method e.g. science or history or mathematics …

⊙ Each team collaborated with the teacher concerned (in this case the author of this paper) to select the topic

⊙ The topic was subjected to chunking thereby extracting strands of information.

Design

❑ Based on the chunked content, the learning outcomes were framed.

❑ Content was organized and sequenced.

❑ Content layout was scripted according to the templates that LCDS had to offer such as; interact, watch, read... Content validity was determined by cross group interaction i.e. across groups of students reading the same subject e.g. science -science.

❑ Trainees were exposed to various ICT tools to capture video, audio, edit video, audio, images, tables, charts and other illustrative material. The idea of screencasting and use of a camcorder and digital camera was illustrated. Trainees selected appropriate ICT tools based on the nature of the digital material they planned to create.

❑ Variety of in-built assessment formats in LCDS were chosen based on the content and developer's preference.

Software Tools

1. CamStudio

2. Format Factory

3. Audacity
4. Blender/ Movie Maker
5. PowerPoint
6. LCDS by Microsoft

Development

❏ The final storyboard was devised for each type of media element such as audio, video and text. The storyboard was inspected for sequence, coherence, grammatical correctness and relatedness to the ecology of the place. Once the storyboard was approved the learning objects were created.

These learning objects were then integrated into the appropriate LCDS templates namely; interact, read or play. The learning material before being saved as a SCO was verified for alignment of learning outcomes, activities and assessment (tests).

Implementation and Evaluation

The completed SCO's were not implemented at school, but, were peer assessed.

The graphic organizer presented below will help the reader to understand the order of development of the SCO
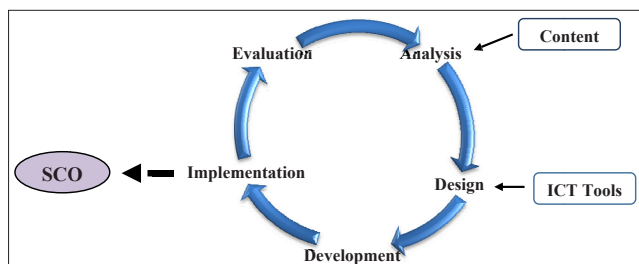
Methodology

Method:

The case study approach was adopted in the study.

Sample

The sample for the investigation comprised altogether 100 students reading the B.Ed. programme in a College of Teacher Education affiliated to the Goa University, Goa, during the academic year 2016-17.

Tools

1. E-learning Digital Materials Development Tool (DMDT): to measure the students'

reaction (attitude) towards developing the SCO. The DMDT comprises 19 items and was designed by the investigator.

2. Reaction to e-learning: questionnaire to measure students' reaction to the use of e-learning.
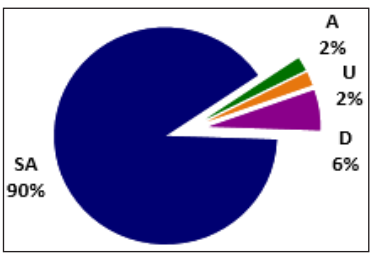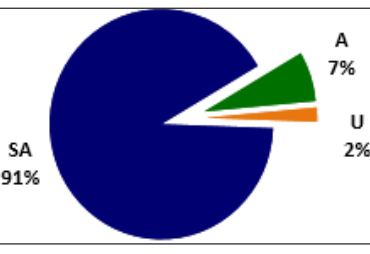
Analysis of Data
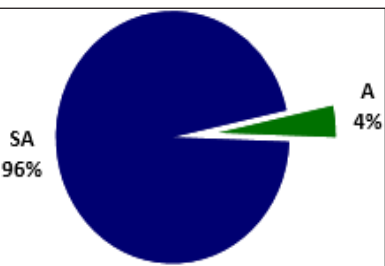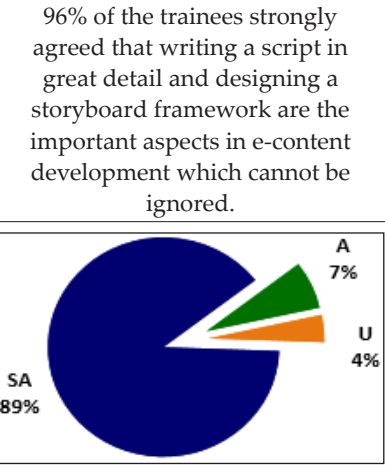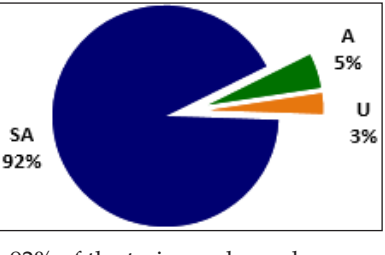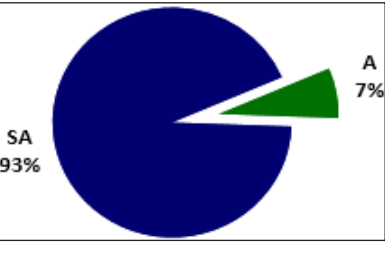
Objective No 1:
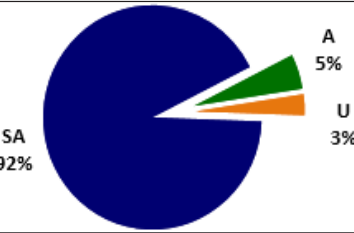
To develop e-learning sharable content objects (SCO) in teams (4 teacher trainees per team) across different school subject. Visit https://drive.google.com/open?id=0B6TCYA_6d0wnd1BQV3ZJRXpHbWc
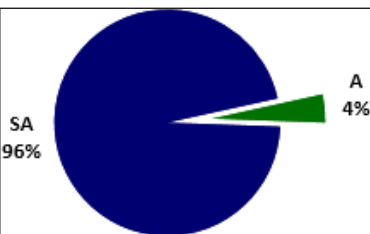
Objective No 2

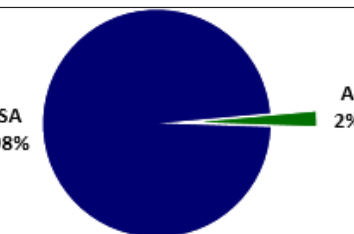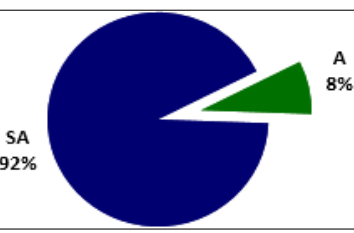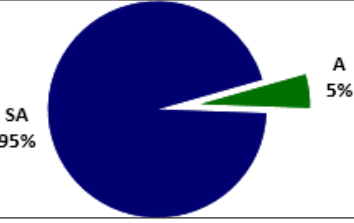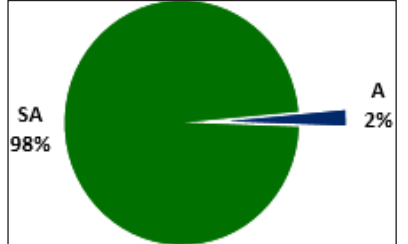To measure the students reaction (attitude) towards developing the SCO

Sl. No	Statements	Findings
01	Clearly stated learning outcomes eases content development.	97% of the trainees strongly agreed that learning outcomes when clearly stated helps to develop content with a lot of ease. Outcomes provide direction as to 'what the learner will do at the end of instruction'. This helps the developer to structure content accordingly
02	Identifying the learner audience, it's characteristics and planning accordingly is the focus in developing e-content.	92% of the trainees strongly agreed that, knowledge about the target audience is essential as it focusses reason and analysis thereby leading to creation of interesting and insightful learning modules.

03	Content analysis and chunking of content requires a logical approach.	

90% of the respondents strongly agreed that chunking of content requires a logical and systematized thought process. Surprisingly, 6% of the respondents countered the need for content analysis and chunking.

04	Accuracy and relevance of content to the ecological reality is necessary	

93% of the trainees strongly agreed with the statement that; appropriateness of the content to the ecological reality of a place is important, when developing e-modules. This fact is re-inforced by the tremendous response in the affirmative by the trainees. However, 4 % of the trainees were divided in their opinion.

05	Content has to be presented in an organized and coherent sequence	

91% of the trainees strongly agreed with the statement which affirms that, organization and sequencing has a very important place in e-content development.

06	ICT tools for content development are to be carefully chosen.	

92% of the trainees strongly agreed that carefully selecting ICT tools to develop smoothens the work flow.

07	Writing the script and designing the storyboard for the e-learning material requires skill	

96% of the trainees strongly agreed that writing a script in great detail and designing a storyboard framework are the important aspects in e-content development which cannot be ignored.

08	The learning material must closely connect the old and new learning	

89% of the trainees strongly agreed with the basic instructional tenet that; the learning material must facilitate a smooth transfer to the new learning by building **connect** between the old and new learning.

09	Presentation of the content must be clear and systematic (diagrams, figures, graphics, spelling/ grammar, pronunciation, diction …).	

92% of the trainees showed a very showing inclination towards an orderly presentation of content which is clear and systematic.

10	Clear instructions for using the e-learning material are to be provided	

93% of the trainees strongly supported the idea that clear instruction on how to use the e-learning module is of utmost importance. However, 7% were indifferent to the statement.

11	An effective learning material aligns learning outcomes, learning activities and assessment.	 85% of the trainees strongly agreed with the idea that an effective e-learning material must clearly and closely associate the learning outcomes, learning activities and assessment.	15	Assessment format/s (tests) after embedding in LCDS is/are tested.	 Testing of the assessment format/s are important to test workability. This was strongly supported by 88% of the trainees. However, a miniscule 2% disagreed with the statement.
12	Creativity and content competence is essential in developing e-learning materials.	 91% of the trainees strongly agreed that creativity and content expertise is essential in developing an e-learning module. Though, 7% were uncommitted to the statement.	16	The working of the module before being saved as a SCO is tested for alignment of learning outcomes, learning activities and assessment.	 98% of the trainees strongly agree that the module before being saved as a SCO must be tested for alignment of learning outcomes, learning activities and assessment
13	The learning material must keep the learner attentive and engaged	 An engaging learning material can keep a learner focusses, engaged and active during learning. This was affirmed by 92% of the trainees. This indicates that the students have developed a favourable attitude towards engaged learning.	17	Learnt to use a variety of ICT tools to create the SCO	 92% of the students said that they learnt to engage a variety of ICT tools in the process of developing the e-module which is commendable. This shows that trainees can be exposed to a variety of ICT tools and helped to integrate them in learning objects.
14	Each digital object (audio, video, graphic) after embedding in LCDS is tested for functionality.	 Testing working of an e-learning module in all respects is essential to avoid post finalization hassles. 92% of the trainees strongly feel that testing functionality of each digital object before embedding in the LCDS is necessary.	18	The learning experience was wholesome as creativity connected with technology	 An overwhelming 95% of the trainees agreed with the statement. This indicates that their creative potential was challenged to connect learning through technology as a powerful vehicle of change.

19	Lack of ICT skills impedes content development	
		96% of the trainees reported that that there exists a close connection between ICT skills and content development through their choice of supporting the statement very strongly. ICT skills are basic to content development which can be honed during the teacher training programmes.

Objective No 3:

To analyze students reaction towards the use of e-learning

Reaction to e-learning: questionnaire to measure students' reaction to the use of e-learning.

	Statement	
01	The e-learning content object enhances the learning experience of a learner	
		All the trainees were of the opinion that e-learning enhances the learning experience of a learner.
02	e-learning material holds the attention of a learner due to the integration of various forms of media	
		95% of the trainees strongly agreed that e-learning can focus and hold the attention of a learner because of a variety of media elements embedded in it.

03	Facilitates retention of the learnt material	
		92% of the trainees opined that e-learning objects facilitate retention of the learnt material for a long time.
04	Learning is flexible and so the leaner can learn at his own pace.	
		91% of the trainees agreed that e-learning objects facilitate convenient learning.
05	Builds confidence in a learner to use technological tools.	
		98% of the trainees strongly believe that exposure to technology to learn builds confidence in a learner to become technology friendly.

Findings

1. Chunking of content, its organization and sequencing in a coherent manner requires a logical though process.

2. Writing a script in great detail, designing a storyboard framework, choosing software, making the content engaging and learning to translate thoughts into creative digital output is a challenging experience.

3. Language, conceptual clarity and its relevance to the local ecological reality is extremely important.

4. The learning material must closely connect the old schema with the new learning so that the learner enjoys learning through the e-learning material.

5. Knowing about the target audience and its characteristics facilitates appropriate content development.

6. ICT tools needed for developing the learning objects are to be carefully selected based on the authors idea of the content and the template to be used to present the content object.

7. The trainees strongly supported the fact that presentation of the content must be clear and systematic (diagrams, figures, graphics, spelling/grammar, pronunciation, diction …).

8. Clear instructions for using the e-learning material are to be provided

9. Each digital object (audio, video, graphic) after embedding in LCDS must be tested for functionality.

10. An effective learning material aligns learning outcomes, learning activities and assessment.

11. The trainees reported that they were skilled in developing SCO's and that lack of ICT shills impeded development of content objects.

12. E-learning objects hold attention and increases retention due to the in-built media elements in the SCO.

13. There was an overall positive attitude towards embedding e-learning SCOs in teaching

14. Trainees strongly believed that exposure to technology to learn builds confidence in a learner to become technology friendly.

CONCLUSION

Though the going was tough, it was heartening to see that the trainees (totally novices) learnt the nuances of creating digital learning objects which were then embedded into the LCDS. The trainees displayed a positive attitude to not only designing the SCO, but also to the use of e-learning in the classroom.

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