COURSE: DDE 624- Courseware Development for Higher Education
(1 Credit, Elective)

Course Duration: One hour per week for 15 weeks (15 hrs Theory)

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Course Content

Rationale for studying Courseware development, Web-Based learning (WBL), Opportunities in Web-based teaching; Conceptual pedagogy for engaging in effective multimedia and instructional virtual courses, Multimedia in the instructional e-learning environment; Integrated model of multimedia effects on learning; Introduction to courseware templates and prototypes; Courseware templates and prototypes adaptation strategies; Infrastructural issues of Courseware in Web-based teaching; Selecting software and services for web-based teaching and learning; Developing a class session using Audio, Video and Textual streaming; Distance education and personal hosting of Web courses; Web-Based assessment and feedback management; Developing On-line collaboration.

Course Description

The course focuses on the significant courseware development in higher education. It will discuss the development of interactive e-learning courseware and focused largely on the instructional design approach of multimedia applications for virtual courseware delivery that can bring about a substantial amount of success in producing engaging multimedia educational resources. This course will also explore how incorporating the principles of cognitive psychology in the design phases can enhance the multimedia instructional strategies and processes involved in courseware development. Learners will be exposed to the theory of human cognitive architecture that involves both, a limited working memory with visual and auditory channels, and a permanent long-term memory for storing multiple schemas. The course will expose the learners to the understanding and tapping of the rich potentials afforded by the human cognitive architecture that would result in a more purposeful instructional programme embedded in multimedia-mediated learning environments. The course will expand the repertoire of learners to the methodologies of selecting software and services for web-based teaching and learning; developing a class session using audio, video and textual streaming; relevance of courseware in distance education delivery and the techniques and issues in web-based assessment will be discussed.
Course Justification
In the recent time, achieving sustainable development and excellence in higher education is anchored on effective development of courseware and its application in a web-enabled environment. The development of interactive e-learning courseware has focused largely on the instructional design approach of multimedia applications and has brought about a substantial amount of success in producing engaging multimedia educational resources.

E-learning has gained immense popularity. Debunking traditional notions of how teaching and learning have been taking place in educational ecology, e-learning has bridged the constraints of time and geographical distance that characterized the traditional learning system, and it has diffused into a flexible yet dynamic mode of study for populations of learners, taking into account their varied learning styles and needs. E-learning is now widely hailed and synonymously associated with a more effective and efficient learning outcomes. However, challenges associated with early stages of e-learning courseware development are significant when compared to those at the later stages. Addressing these challenges requires sensitivity to the process dynamics, besides the technical know-how.

Lecturers in higher education need to be fully aware of the intricacies of integrating instructional design principles and evaluation techniques to tackle the challenges of the evolving courseware design. The learners may also find the concept of courseware design helpful, given the constant demand to innovate in the learning contexts, and may well find some applicability for it in their own disciplines.

Course Objectives
At the end of the course, it is expected that the learners should be able to demonstrate thorough understanding and deep knowledge by explaining/discussing the following:

1. Rationale for studying Courseware development,
2. Web-Base learning (WBL) and opportunities in Web-based teaching;
3. Conceptual pedagogy for engaging in effective multimedia and instructional virtual courses,
4. Multimedia in the instructional e-learning environment;
5. Integrated model of multimedia effects on learning;
6. Introduction to Courseware Templates and Prototypes;
7. Courseware templates and prototypes adaptation strategies;
8. Infrastructural issues of Courseware in Web-based teaching;
9. Selecting software and services for web-based teaching and learning;
10. Developing a class session using Audio, Video and Textual streaming;
11. Distance Education and personal hosting of Web courses;
12. Web-Based assessment and feedback management;
13. Instructional Delivery on the Web and Developing On-line collaboration.
14. Revision and Face-to-face interaction
15. Examination

Course Requirements
Active participation of the learners is essential during on-line discussion and assignments. On-line participation in discussions and attendance is mandatory to familiarize with the learners and the lecturer. Later, learners can do individualized and group discussion instruction on-line. Each student is expected to submit one assignment and do one test for the continuous assessment. Learners would be subjected to the end of course examination where
they will answer three questions only. (Both the test and end of course examination may be done on-line)

**Methods of Grading**

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**Course Delivery Strategies**

On-line lectures, questioning and discussion techniques would be employed. Learners would be referred to textbooks, academic journals and on-line readings where they will be acquainted with the topics ahead of the lessons. Learners may be assessed on-line to explain what they have learnt. Learners would be encouraged to search the internet and find additional information on each topic. Active participation of learners in the class through questioning would be encouraged. Power point presentation would be used mostly in lessons’ delivery that may be uploaded for learners on-line. On-line discussions would be encouraged and given priority.

**LECTURE CONTENT**

**Week 1:** Rationale for studying Courseware development

**Objectives:**

At the end of the first week, learners should be able to discuss the various reasons for studying Courseware development. Students should also be able to define courseware and describe types of courseware.

**Description:**

The first lesson would be for the general overview of the course. Definition of Courseware and types of courseware will be discussed. During the second lesson, there would be discussion on the reasons why we study courseware development so that learners can have adequate knowledge of what courseware development is all about.

**Revision Questions**

1. Explain what you understand by Courseware
2. Discuss four (4) types of courseware you know
3. As a lecturer, why do you think you need Courseware development as a course of study?
4. Is web-based courseware development an innovation or an aberration? Discuss.
5. What are the necessary prerequisites required of a student in courseware development course?
Week 2: Web-Based learning (WBL) and opportunities in Web-based teaching

Objectives:
The main objective of this week is to discuss Web-based learning and teaching in higher education. Advantages and disadvantages of Web-based learning in Nigeria would be the major focus for this week.

Topic Description

The lesson is for the discussion and appreciation of Web-based learning and also on Advantages and disadvantages of Web-based learning. The general benefits of Web-based training when compared to traditional instructor-led training. There are only two real disadvantages to WBT, the first drawback, when compared to live instruction, is the lack of human contact, which greatly impedes learning, the second disadvantage is high bandwidth network connections problems. Both will be overcome in the next five to ten years as high bandwidth network connections become as common as telephones.

Study Questions

1. Discuss the general benefits of Web-based training when compared to traditional instructor-led training.
2. Discuss the general benefits of Web-based training when compared to CD-ROM instruction
3. There are only two real disadvantages to WBT. Discuss.
4. Discuss how these disadvantages can be ameliorated.
5. WBT programs are still comprised of text and graphics alone. Discuss.

Reading List

Week 3: Conceptual pedagogy for engaging in effective multimedia and instructional courseware design

Objectives: This topic is to expose learners the principles and methodologies of designing courseware for web-enabled environment.

Topic Description

Discussions of e-learning models based upon sound instructional strategies that are embedded in the philosophy that learners learn with technology and not from technology, would surely help to advance the cause of learning mediated by technology. Further discussion that e-learning often emphasis indiscriminate integration of technological tools in teaching and learning will be discussed. E-learning with appropriate and thoughtfully harnessing of technology to realize positive learning outcomes will also be discussed. This could prevent the pitfall of delivering e-learning materials that are ordinary, wishy-washy, uninteresting and most crucially, fail to impact on the learners’ cognitive development.

Study Questions
1. Define ‘learning from technology.
2. Define ‘learning with technology’
3. Explain the difference between learning with technology and learning from technology.
4. Which of the two concepts above is highly supported by courseware?
5. Discuss two models that support courseware delivery and web-based training.

Reading List

Week 4: Multimedia in the Instructional e-learning Environment

Objectives

This is to expose the learners to Multimedia use of text, graphics, animation, pictures, videos and sound to present information. Simultaneous use of multiple media formats and the use of materials that enhance multi-sensory applications and integration in learning.

Description

The use of text, graphics, animation, pictures, videos and sound to present information. Simultaneous use of multiple media formats. Introduction to the use of materials that enhance multi-sensory applications and integration in learning. The role of multimedia in the instructional design of e-learning materials. Influence of multimedia on the design processes of digital educational courseware. Effective multimedia usage to enhance online learning productivity and optimize learners’ cognitive development.

Study questions:
1. Discuss the main components of multimedia
2. How can the components identified in (1) above enhance multi-sensory application and integration of learning
3. Discuss how you can use multimedia to optimize learners’ cognitive development.
4. What is the difference between text and graphics?
5. In what scenario will you consider using video format for instruction?

Reading List:
   http://books.google.co.za/books?hl=en&lr=&id=AxA5m5mxNUgsC&oi=fnd&pg=PA3

Week 5: Integrated Model of Multimedia effects on Learning

Objective: The objective of the week’s lecture is for the learners to be able to explain the developmental framework for delivering sound e-learning instructional materials. Learners would be exposed to the integrated model of multimedia proposed by Hede and Hede (2002)
Description: Discussion of the integrated model of multimedia effects on learning proposed by Hede and Hede (2002). Concepts to be treated include Visual Input, Learner Control, Auditory Input, Motivation, Attention, Learners Style, Working Memory, Cognitive engagement and Intelligence.

Study questions:
1. Enumerate the major components of Integrated Model of Hede & Hede (2002)
2. Explain the working memory component of the model.
3. Explain the principle of motivation and how you can enhance learning through motivation.
4. What is the difference between intrinsic and extrinsic motivation?
5. What complementary roles do visual input play in the integrated model?

Reading List:

Week 6: Introduction to Courseware Templates and Prototypes

Objective: The main objective is for the learners to be able to discuss different types of courseware templates and prototypes and also to be able to explain some of the components and structures of courseware templates within multimedia environment.

Description: Understanding different types of courseware templates and prototypes; explanations on some of the components and structures of courseware templates within multimedia environment. Understanding prototyping

Study Questions:
1. What is courseware prototype?
2. What is courseware template?
3. What is the difference between a template and a prototype?
4. Describe the components and structure of courseware template.
5. Describe the components and structure of courseware prototype.

Reading List:
   http://books.google.co.za/books?hl=en&lr=&id=AxMv5mxNUgsC&oi=fnd&pg=PA3 &dq=book+on+courseware+development&ots=g0GcraIzQE&sig=n5O_U7 sj3xHBldsk92lswuwccA#v=onepage&q=book%20on%20courseware%20developme nt f=false
Week 7: Courseware templates and prototypes adaptation strategies

**Objective:** The learners would at the end of the lesson be able to explain strategies for adopting and adapting templates and prototypes for courseware development.

**Description:** Understanding conceptual framework for adopting and adapting templates and prototypes for developing web-enabled courseware. Study of courseware template and prototype designs. Understanding the pedagogical principles guiding multimedia integration e.g. Split-Attention Principle, Multi-modality principle, Redundancy Principle, Element Interactivity Principle and Individual Differences Principle.

**Study questions:**
1. Enumerate three (3) principles guiding the adaptation of courseware templates.
2. Explain (3) guiding principles for adopting courseware prototypes.
3. What is split-attention principle and how is it different from redundancy principle?
4. What is cognitive overload?
5. How can you avoid cognitive overload in your prototype design?

**Reading List:**

Week 8: Infrastructural Issues of Courseware in Web-based Education

**Objective:** The learners should be able to explain and discuss infrastructural requirements needed for a successful Web-Based Education (WBL).

**Description:** Issues, trends and environment needed for a successful WBL experience. Requirements like sufficient funding, strong technical infrastructure, good design and interfaces, operations and maintenance. Recognizing lack of resources and
telecommunication infrastructure as the two main barriers to WBL. Suggestions on the use of producing Web-based lessons on CDs for possible Web enhancement purposes

**Study questions:**
1. Enumerate and discuss in details, the infrastructural requirements of a successful Web-based learning.
2. What dominant role does communication infrastructure play in the successful delivery of Web-based learning?
3. Justify the roll of sufficient funding as strong requirement of successful web-based learning.
4. Describe the complementary role of instruction CDs, VCD, and DVDs in web-based learning.
5. Identify two infrastructural barriers of Web-based learning and suggest ways of ameliorating them.

**Reading list:**


**Week 9: Selecting Software and Services for Web-Based Teaching and Learning**

**Objective:** The learners should be able to explain some software applicable to Web-based learning. The learners should be able to give vivid description of software components and selection parameters.

**Description:** This topic is about selection of software package for use in the development of on-line course e.g. Learning Space and Screen Shots will be used to explain concepts to the learners. Navigation of the learning space screens which may not apply to all software packages will also be discussed. The use of models to describe step-by-step guide and illustration on the selection process using case studies.

**Study questions:**
1. Identify and discuss two software packages applicable in developing web-based learning.
2. Use a model to describe step-by-step guide on the selection web-design software.
3. Describe some navigation features of a typical learning space screen.
4. Briefly describe what you understand by screen shots.
5. How will you capture screen shots for instructional use.
Reading list:


Week 10: Developing a Class Session Using Audio, Video and Textual Streaming

Objective: The learners should be able to explain and discuss audio, video and graphics streaming

Description:
Description of the processes of creating class sessions using audio streaming, audio and graphics and audio and video streaming shall form the main line of discourse. The lesson shall also discuss the set-up of a streaming media server.

Study questions:
1. Describe the procedure for creating class sessions using audio streaming.
2. How will you streamline audio and graphics?
3. Describe the techniques of streaming audio and video in a classroom session
4. Describe how you can set up a streaming media server.
5. How will you avoid cognitive overload when streaming audio and video in the classroom

Reading list:


Week 11: Distance Education and Hosting of Web Courses

Objective: By the end of this week, learners should be able to highlight the relevance of courseware in the delivery of distance education system. They would also be provided with information on Web courses hosting.

Description:
Discussing ‘desktop hosting’ of Web-based course materials. Information on desktop hosting that provides more control of the course and more flexibility in designing the course. The pros and cons of institutional versus personal hosting shall be discussed. Discussion on technology implementation in course delivery in traditional university setting. Model Calculus of communicational structure, semantics and dynamic components shall be discussed.

Study questions:
1. Discuss the relevance of courseware in the delivery of distance education.
2. Identify and discuss the pros and cons of institutional and personal hosting.
3. Discuss the technology implementation in course delivery in traditional university setting.
4. Write explanatory notes on Model Calculus of communication structure.
5. Write explanatory notes on semantics and dynamic structure of communication.

Reading List:

Week 12: Web-Based Assessment and Feedback Management.

Objective: Learners, at the end of the two hour lesson, should be able to describe Web-based assessment and feedback management with reference to many issues like data security, data management, data manipulation; learners’ identification and plagiarism.

Description:
New method of testing learners learning and assessment would be discussed. Need for lecturers to be trained to provide on-line lectures. Information of currently available commercial tolls for web-based testing would be discussed. Description on how using Common Gateway Interface (CGI) and JavaScript technology, instructors can develop their
own Web-based testing tools. Feedback management with reference to many issues like data security, data manipulation; learners’ identification and plagiarism will also be discussed.

**Study questions**

1. Describe the technology that could enable you develop a customized testing tool.
2. Justify with reasons, why faculty needs to be trained on virtual course delivery.
3. How can you tackle the problem of data manipulation among learners?
4. How can you tackle the problem of plagiarism during web-based learning?
5. Describe how you can use Common Gateway Interface (CGI) and JavaScript technology, tools to develop web-based testing tools

**Reading List:**


**Weeks 13: Instructional Delivery on the Web and Development of Collaborative Learning on the Web**

**Objectives:**
Learners will be acquainted with relevant information on instructional delivery on the web. They will be able to also describe faculty involvement in the development process. Learners will be able to also describe how to develop collaborative learning on the web.

**Description:**
Discussion of instruction delivery on the web will form a major discourse. Faculty development process in relation to a comprehensive web-based course management tool will be fully described. Description of three basic areas: training structure, pedagogical support and faculty support, to prepare faculty to use on-line resources successfully. The need to focus on skills to use the tool and also on pedagogy underpinning the effective use of the tool will also be discussed. Description of collaborative learning on the web is also to be covered.

**Study questions:**

1. In what ways can the Faculty be involved in development process of ensuring quality among members on web-based course delivery?
2. The need to focus on skills to use the web-based tool and also on pedagogical of use are indispensable – Discuss
3. Describe three basic areas of web-based course management structure.
4. How can lecturers be fully prepared to successfully use online resources?
5. What training structure will you recommend for lecturers to successfully prepare them for instructional delivery on the web?
6. Describe how you can develop collaborative learning on the web.
7. Describe the collaborative group development model

Reading List


Week 14: Face-to-face Interaction/Revision

Objectives:
Learners would be given opportunity to seek explanations on any of the topics of the course taught during the semester lectures.

Revision questions:

2. Explain what you understand by Courseware
3. Discuss four (3) types of courseware you know
4. Discuss the general benefits of Web-based training when compared to (i) traditional instructor-led training (ii) CD-ROM training
5. There are only two real disadvantages to WBT. Discuss
6. Discuss how these disadvantages can be ameliorated?
7. Distinguish between learn with technology and not from technology.
8. Which of the two concepts above is highly supported by courseware?
9. Discuss two models that support courseware delivery and web-based training.
10. Discuss the main components of multimedia
11. How can the components identified in (1) above enhance multi-sensory application and integration of learning?
12. Enumerate three (3) principles guiding the adaptation of courseware templates.
13. Explain (3) guiding principles for adopting courseware prototypes.
14. Discuss how you can use multimedia to optimize learners’ cognitive development.
15. Enumerate and discuss in details, the infrastructural requirements of a successful Web-based Learning.

General Reading List


Week 15: Examination

LEGEND:

¹ – University Library
² – Bookshops
³ – The Internet
⁴ – Personal Collections
⁵ – Departmental Libraries