



## PERCEPTIONS, MOTIVATING AND IMPEDING FACTORS OF COURSEWARE DEVELOPMENT IN NIGERIA

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### Abstract

This paper is based on an in-progress project to detect challenges in the early stages of courseware development. An understanding of the perceptions and factors that motivate or impede faculty in the development of online course materials for their various undergraduate and diploma courses is to address and strengthen courseware development. The initiatives have been taken in the area of open courseware development for all undergraduate studies and the postgraduate diploma in education, PDDE at the University of Ilorin, Nigeria that is a pioneer in this regard in the country. A pure quantitative method using descriptive survey approach was adopted. Questionnaire was used for data collection. A test-retest reliability was embarked upon to determine the reliability of the questionnaire. A statistical package for social sciences (SPSS) was used to analyze the data and method of analysis included: percentages and frequency count. The findings reveal factors hindering faculty contribution to courseware development to include: lack of experience or orientation on courseware development, lack of motivation for faculty, lack of familiarity with courseware, etcetera. Adequate technical support is necessary for the lecturers to continue courseware development smoothly.

**Keywords:** open access; open courseware; institutional repositories; courseware development; developing countries; Africa; Nigeria

### INTRODUCTION

The development of Internet technology has created enormous opportunities to bring the results of research to all through digital communication – to anyone, anywhere and at any time. The impact of the convergence of traditional modes and new technology makes it possible to access information conveniently and instantaneously. By “open courseware” or “courseware development” much like “open access” in this literature, refers to course or teaching materials freely available on public internet, permitting any users to read, download, copy, distribute, print, search or link to the full texts of these course materials and associated links, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal or technical barriers other than those inseparable from gaining access to the internet itself (Budapest Open Access Initiative, 2002). Thus, open access may be defined as a philosophy to achieve the goal of accessing and making digital material, which may or may not be free from copyright and licensing restrictions, available free of charge for those who need it for scholarly purposes.

Though the philosophy of open access emerged in the context of scholarly publishing and communication, over the time the onus has come to be placed on the authors, wherein emphasis has been placed on the firm commitment of individuals to make open access successful. The development of open source is to fulfill this commitment. Various forms of open access have been evolved. Open courseware plays a significant role in open and distance education. For instance in the United Kingdom, the Open University has already opened its courseware from as early as the year 2006. A country very similar to Nigeria, India, its Indira Gandhi National Open University (IGNOU) had taken up a project e-Gyankosh where all the courseware developed by the university was being placed in an open access repository online to facilitate wider accessibility. In the context of those countries where access is hindered by economic constraints, all these developments are quite significant. The development of free and open source software packages, such as DSpace and EPrints, is facilitating access to all kinds of material irrespective of scholarly publication.



Wikipedia describes courseware as a term that combines the words 'course' with 'software' and at its inception was used to describe additional educational material intended as kits for teachers or trainers or as tutorials for students, usually packaged for use with a computer. However, over the years courseware has included in some cases the entire course, materials used for teaching, tests, lessons, objectives of topics, references and web links to literature on the course and all other associated materials made available online in a single bundle or product. The courseware itself can be in different formats, some are only available online such as text only, html pages, while others can be downloaded in pdf files or other types of document files such as with video, audio and hypermedia integration for learners to visualize and articulate. The courseware is a tangible product that can include myriad products, multi media such as Web pages, video clips, packaged readings, animation, and simulations that together create a package that is tangible and marketable. Many other forms of e-learning are now being blended with term courseware. Close related concepts are other categories of educational software, classroom management software, classroom aids – electronic blackboard, virtual learning environment (VLE) and learning management system (LMS).

Pinfield, Gardner and MacColl (2002) report that e-print archives and self archiving institutional repositories are all initiatives towards open access and that the courseware as an online repository of materials made easily available on the web for the widest possible dissemination of knowledge is not without its difficulties, challenges particularly frustrations of courseware developers. At the Massachusetts Institute of Technology (MIT), for example, Open Courseware (OCW) is a major successful project that provides free access to around 2,000 courses. Its philosophy is to bring MIT education to the doorsteps of learners who are not fortunate. Universities from developing countries and Nigeria in particular need to be evaluated as to why they have either not explored this option of open courseware development or why progress in this drive is so slow. What are the perceptions of faculty of courseware development? How motivated are faculty for courseware development? These and other questions will be addressed in this study.

Making a success of open courseware development by universities in Africa, developing countries and Nigeria is paramount because of the advantages of courseware development as can be gleaned from literature on successes from other climes. There are the challenges of growing number of undergraduates in institutions in Nigeria and distance learning, an option. Open courseware is also complimentary of face to face teaching, tradition methods of training in Nigerian universities. The open access concept has now expanded to include the area of learning resources, through Open Courseware (OCW). Open access is a cost effective way to disseminate and use information. It is an alternative to the traditional subscription-based publishing model made possible by new digital technologies and networked communication (Association of Research Libraries, 2004). For the developing world, the open access movement has come as a boon. Courseware development makes it easy for faculty to post and share a syllabus or other documents, create homework turn-in areas for students, return homework to students, offer quizzes and surveys, and provide forums for online discussions. It also provides for “one-stop shopping” courseware experience where faculty can see and access all course-related tools and resources together in one space. Institutions promote open access to the research work carried out by them through establishing institutional repositories. These are digital archives of intellectual products created by the faculty, staff, and students of an institution and accessible to end users both within and without the institution, with few if any barriers to access. Institutions may act independently or within a state or regional consortium (Association of Research Libraries, 2004).



However, there are several issues challenging open courseware development. With the advent of the Internet, and in particular the capabilities of the World Wide Web (Web), issues of intellectual property have once again become the basis for discussion and debate. One of the most interesting and complex an issue of intellectual property in the digital environment is faculty ownership of online courses referred to as courseware. In fora where the issue of ownership is discussed, very strong opinions come forth from both the administration and faculty on whom should hold copyright and each constituent group makes it clear they are concerned with protecting their investment in the final product (Carnevale, 1999).

Recent developments in Information and Communication Technology systems offer new capabilities for the delivery of instruction throughout all educational settings. At the moment universities are exploring ways of providing flexible learning systems that will meet the ever-increasing demands of a complex and diverse student group. Moreover, in cases where the number of students has increased dramatically without an analogous increase in teaching staff, or in cases where universities in different countries are offering collaborative degrees, the employment of modern technology for teaching and learning is seen as the only way to maintain and promote the quality of the instruction. The thinking of institutions is to provide distance learning (DL), online distance learning (ODL) and life-long learning. This paper forms part of a much larger study of ways of achieving these objectives. The broader study seeks to determine the factors that motivate or inhibit faculty in courseware development as use of ICT has become the trend in tertiary education. There is the wish to increase and to speed up academic and social integration of faculty to their new learning environment in Nigeria. From observation there are difficulties and frustrations amongst faculty and courseware developers owing to technical problems, etc. Literature appears to be rife with studies on students and technicalities of technology but very little on how faculty can be motivated to overcome inhibiting factors to courseware development (The Node Learning Technologies Network, 1999). This study will examine the proactive motivation of lecturers prior to the course start and the problems they encounter in the design and development of courseware for their courses across disciplines.

The traditional hard copy course outlines as an exclusive tool to support teaching is not without its shortcomings and challenges some of which is a period of time between the student enrolling on a course and receiving the course materials mostly becoming available to students at end of the course or never at all. In any case, there are delays in the provision of course materials to students. Unfortunately this delay may often be caused by course revisions, essential to keep the course materials current. In others, the course outlines and materials are not reviewed from year to year (Twigg, 2000). This becomes more challenging in the phase of distance learning and the options provided by internet technologies more auspicious to make course materials available to students online.

The advantages of the courseware are in the proactive contact by the lecturer, with reactive action where problems are found, by both lecturer and the students thereby resolving the problem of not being able to contact the course lecturers. This combination of proactive and reactive contact set up the students to receive regular bulk emails throughout the course. This provision is in addition to peer and lecturer support via the discussion forums in our electronic forums. However, from observation and review of related studies (Carnevale & Young, 1999; Twigg, 2000; Pinfield, Gardner & MacColl, 2002; Hickey and Davies, 2003; Kasirun, 2005) courseware development has been abandoned by faculty in many cases as a result of time consuming processes of design and development, low perceptions of courseware development by faculty, little or no training of faculty in design/development of courseware, absence of motivation, copyright and ownership issues and fears held by faculty, lack of studies on faculty perceptions and requirements to meet open courseware development to name but a few which this study will analyze.



This study will help assist in the understanding of faculty perceptions of courseware use and factors that motivate or impede its development and outcomes will support in the execution of a courseware development according to faculty teaching beliefs and values. Lastly, this study will assist the goal of the university to improve teaching and learning experiences by development and use of courseware.

### **Open Courseware Development in the University of Ilorin**

The reason for the choice of lecturers of the University of Ilorin, Nigeria as target population for the study is because the University is not only a pioneer in this regard but also a leading institution in the country in recent years. The university is also a federal establishment with a broad base of lecturers from all around the regions of Nigeria and a sizeable number of international scholars. The courseware development initiative began with the establishment of a university wide courseware development committee, saddled with responsibility of providing expertise in learning styles, pedagogy, instructional design, teaching and learning, learner-center environments in the process of courseware design, development and implementation. Studies outside the University of Ilorin have shown the advantage of open access publication in terms of access and research impact (Antelman, 2004). At various fora during the kick off of the courseware development training for faculty in a series of workshops, some participants demonstrated a reluctance to embrace open courseware development due to what they termed peculiarities in their disciplines, issues of premature disclosure, plagiarism, fear of upsetting the current system, indifference, long term storage and retrieval, and intellectual property rights of their work, etc were among the most noted. All of these fears were also noted in a study by Yiotis (2005).

The university wide courseware development committee saddled with the responsibility of training lecturers the skills of courseware design, maintaining a database of all courseware materials on the university website and other management issues in the provision of support and resources management for an Institutional Repository (IR), faces significant challenges, among them the ability to persuade faculty to contribute important research representing large investments of time, this is in line with a study by van Westrienen & Lynch (2005). Other challenges identified in the work of the University of Ilorin Committee included, faculty preference for traditional publication workflows and practices vary for each academic discipline, it is reasonable to assume that motivations and concerns vary as well.

The University of Ilorin Courseware Development Committee followed an instructional alignment, which refers to the alignment of the learning objectives, content, instructional strategies and assessment. The objectives, which should be measurably defined, serve as the starting point. The objectives are then used to determine suitable content, instructional strategies and assessment methods. The Committee followed this principle of alignment (instructional design) which is central to the design of any instructional material. This design was carried out by experts from faculty of education and others before a university-wide workshop both centrally and on faculty basis to equip faculty with skills on courseware development. The Committee thereafter came up with a courseware template for the university after far-reaching consultations with experts within and without the country. The template has five sections: the introductory part, course description and expectation, delivery strategies, assessment and evaluation, lastly, reading materials. The introductory section provides for communication, interaction and feedback from students and learners and is supportive of correspondences between faculty and learners by email, discussion forums, mobile phone and several other means. The core of content design is to be taken over in the online distance learning (ODL) phase of the university's project which is not part of this study. As such, the courseware development of the institution stops at the provision of weekly topics/modules, weekly objectives and learning goals, study questions and reading materials. The teaching contents proper are taken over at the ODL phase.



In the wider forums (other than strictly courseware related) where the issue of ownership is discussed at the University of Ilorin, very strong opinions come forth from both the administration and faculty on who should hold copyright and each constituent group makes it clear they are concerned with protecting their investment in the final product. The studies by Carnevale (1999), The Node Learning Technologies Network (1999) and Twigg (2000) corroborate this. On the face of it, it would appear that there is a wide gulf between the two groups of faculty – administration, and both sides have legitimate concerns.

Recent position papers on faculty ownership demonstrate the extent to which differences of opinion exist concerning faculty ownership of digital resources. For example, at a workshop held in Abuja in 2009 for top administrators of Nigerian universities organized by the National Universities Commission of Nigeria (NUC) a body responsible for the management of all Nigerian universities, it was concluded that the institution reserved the rights to intellectual property since the lecturers were employed by the institution and that rights over the courseware and related materials for instance were exclusive to the institution and not individual lecturers. This is a clear departure from the example from the American Association of University Professors (AAUP) for instance that developed a statement on copyright (<http://www.aaup.org/spccopyr.htm>). In their statement, they assert that “it has been the prevailing academic practice to treat faculty members as the copyright owner of works that are created independently and at the faculty member’s own initiative for traditional academic purposes. Examples include class notes and syllabi, books and articles, works of fiction and nonfiction, poems and dramatic works, musical and choreographic works, pictorial, graphic, and sculptural works, and educational software, commonly known as “courseware.” (AAUP, 1999).

The issue of faculty ownership in higher education has been somewhat an issue until the last few years. Until recently, the issue was straightforward, faculty typically held copyright with everything except patents. Until technology entered the picture, this was the policy arrangement university administrators, either explicitly or implicitly, maintained with their faculties. With the advent of the Internet, and in particular the capabilities of the web issues of intellectual property have once again come to the fore. One of the most interesting and complex an issue of intellectual property in the digital environment is faculty ownership of online courses commonly referred to as courseware. It is worthwhile to find out what other learning management system or technology faculty use in his or her teaching. This piece of information may provide new insights into the research problems of this study and may be useful for future research and study. It is also informative for the purpose of this study to find out why faculty has not chosen to use courseware in his or her teaching.

### **Statement of the Problem**

Though the concept of open courseware is still new in Nigeria and evolving world over, there are many aspects for discussion and exploration. There is a considerable debate as to who should be responsible for maintaining courseware materials, the intellectual property rights of authors and publishers who in this case are members of faculty, content management, preservation, and modes to ensure the quality, motivation for faculty in terms of the personal and budgetary implications, and the technology to employ. The knowledge of the weaknesses in the courseware development system at the University of Ilorin, Nigeria is required in order to address and strengthen the system. Exceptions to courseware development trends that show strong contributions from certain disciplines within the University of Ilorin, if known, can be a valuable resource in providing specific rationale, justification, and practical advice in preparing incentives and soliciting materials for faculty to contribute to courseware development on a broader scale university-wide and beyond. Although a few evaluation studies of open courseware development have been undertaken, no effort has been made so far to evaluate the factors that motivate or impede faculty in contributing to courseware development in Nigeria. Several studies have shown that relatively little is



known and less published on faculty perceptions of courseware development, teaching values and support for courseware development (Hardin & Canero, 2010). This study is an endeavour in this direction. It will help to explore the fundamental issues regarding the concept and pave the way to framing basic policies and objectives for initiatives supportive of faculty contribution to courseware development across universities in Nigeria and Africa.

### **Objectives of the Study**

The objectives of the study are to:

1. Investigate faculty perceptions and values of courseware development
2. Identify relationship between teaching beliefs and faculty perceptions of courseware development
3. Identify technology use by faculty in their teaching
4. Determine level of faculty contributions to courseware development
5. Determine barriers and inhibitors to faculty contribution to courseware development

### **Literature Review**

#### **Open Courseware Development**

Ghosh and Das (2007) in a descriptive survey of open access and institutional repositories in India found that the Open Courseware (OCW) movement in that country had gained momentum with announcements of the availability of learning resources on the Internet by three important national level organizations, namely the Indira Gandhi National Open University (IGNOU), the National Council of Educational Research and Training (NCERT) and the Indian Institutes of Technology (IITs). IGNOU is a mega Open University that provides distance education to millions of learners in India and other countries and IGNOU produces self-instructional study materials for various programmes and also hosts a number of educational broadcasting channels. IGNOU has initiated the establishment of a National Digital Repository of learning resources – *e-Gyankosh*. This depository envisages to store, index, preserve, distribute and share the digital learning resources of open and distance learning (ODL) institutions in the country. The National Programme on Technology Enhanced Learning (NPTEL) ([www.nptel.iitm.ac.in](http://www.nptel.iitm.ac.in)) is an open courseware initiative by seven Indian Institutes of Technology (IITs) and the Indian Institute of Science (IISc). This initiative is funded by the Ministry of Human Resource Development (MHRD). The main objective of this programme is to enhance the quality of engineering education in the country by developing more than 200 curricula-based video and web courses. Premier institutions of India are expected to participate in this innovative programme for the production and dissemination of quality courseware in the areas of engineering and technology. Already a number of examples of open courseware are available through its website. In conclusion of the study, it reported that open access was the way out for developing countries to internationalize their publications and tap in the global pool of scholarly work (Ghosh and Das, 2007). Chavez, Crane, Sauer, Babeu, Packel and Weaver (2007) stress that institutional repositories need to provide some value added services in addition to preservation and access to digital objects.

The US Sloan Consortium in a survey in 2002 to 2003 found that about 40 percent of faculty at universities in the U.S. does not accept the value and legitimacy of online education (Allen and Seaman, 2003). The university teachers in the survey raised the following questions: Why should I create technology-based or online materials? What are the incentives? What rewards am I offered for changing how I teach? Are there actually disincentives? Will I lose intellectual control over my course materials if I make even a portion of my materials available online? Computers make copying very easy, and both administrators and faculty question who really owns the digital course materials. If I get another



appointment, can I take this work with me? Faculty sense the difference between traditional classroom courses, which they carry with them in files and lecture notes, and technology-based or digital courses that "exist" on university servers. It is not clear how to resolve or even deal with the differences (Allen and Seaman, 2003)

Liu, Yi and Lim (2009) in a study of multiple case study of the instructor's roles in courseware development reported that past literature on e-learning system and courseware have focused on the system features and on the technologies employed and to integrate IT well with pedagogical principles, it was important to involve instructors in the courseware development. This study sought to gain insight on courseware development by investigating instructor's different roles in each courseware development phase. It used an educational system development model and role theory as theoretical lens, this research conducted multiple case studies involving three sets of language courseware and revealed that courseware development was a gradual process requiring dynamic role playing of the instructor. Lessons were drawn from the case study to improve courseware development efficiency by facilitating instructors' role transition and reducing their role overload and role ambiguity. Theoretical and practical implications of the process-based role framework were discussed.

Beng and Seh (2007) found that lack of experience in the use of self-instructional material among the faculty members was a major challenge to their contribution to courseware development. It found that while the institution it surveyed had achieved some success in implementing self-instructional online learning, the experience was restricted to the language team only and not institution-wide. It stated further that the concept of self-instructional material was fuzzy to many faculty members. It was reasonable to say that, generally, lecturers did not see the distinction clearly between self instructional and informational material in online learning. Although this was an issue that has to be addressed, it also provided an indirect opportunity for the institution it surveyed to engage in staff development in this area. The survey concluded by identifying that lack of specific funding for courseware development, lack of provision for full spectrum of expertise led to ill-defined courseware development teams.

From review of literature, OCW is a tangible product that can include myriad products such as Web pages, video clips, packaged readings, animation, and simulations that together create a package that is tangible and marketable. In the view of faculty, even though the online course is a tangible product, it does not have coherency until the faculty provides the intellectual "glue" (Carnevale, 1999; Twigg, 2000, p. 15). As a result, debating whether the online course can be delivered in the absence of the creator is less of an issue than deciding how to address the ownership and use question for what is already a marketable commodity in use at many institutions using myriad types of agreements with their faculty.

### **Faculty Perceptions and Ownership rights of Courseware**

Carnevale (1999) reported the issue of quality. It found a concern among faculty that once the control of courseware is transferred to the university, the quality of the product could be jeopardized. Or, the original product, that was up-to-date when it was created, could become outdated and the faculty originator could find he is still mentioned as the author. In the same vein, the faculty member might be held responsible for the content without knowing the content is still being delivered elsewhere at the university. Faculty want ownership so they have the right to update the content, ensure the accuracy of the facts presented in the course content, and respond to developments in the field as they occur and need to be incorporated into the course. In the view of many faculty, if they do not have ownership, then it is possible they would not have the authority needed to ensure that their original work product continues to have the same academic integrity it had when it was developed. From the viewpoint of many faculty, ownership is directly tied to academic freedom. If the institution owns their work, there is the possibility



that their employer might want to have a greater say in their work products. A related issue in most reviewed literature issue is the faculty's opinion is on the "marketability" of the final courseware product. The portability of digital work, and the ease of making changes to digital content, heightens faculty awareness of the academic freedom issue and online courseware.

Kelly (2000) in a study on issues and policy models of faculty ownership of courseware for distance learning reported the issue involved in control is the issue of quality. The study found a concern among faculty that once the control was transferred to the university, the quality of the product could be jeopardized. Or, the original product, that was up-to-date when it was created, could become outdated and the faculty originator could find he is still mentioned as the author. In the same vein, the faculty member might be held responsible for the content without knowing the content is still being delivered elsewhere at the university. The study concluded by stating that faculty want ownership so they have the right to update the content, ensure the accuracy of the facts presented in the course content, and respond to developments in the field as they occur and need to be incorporated into the course. In the view of many faculty, if they do not have ownership, then it is possible they would not have the authority needed to ensure that their original work product continues to have the same academic integrity it had when it was developed. Giving faculty ownership, however, does not mean the institution has rescinded all rights to the works.

### **Institutional Perceptions**

From the review aforementioned, members of faculty have legitimate concerns about ownership of courseware and related materials, which may affect their contribution to courseware development but so do university management and administrators. Carnevale (1999) found that faculty do not own patents, they receive royalties instead. From an institutional perspective, the same agreement applies in the case of courseware. If the cost to the institution is significant, then the institution has an interest in ownership and is also very concerned about the return on its investment in the course. Another issue of concern for institutions according to Carnevale (1999) also revolves around return on their initial investment, is licensing to external organizations. The process of licensing is complicated and few institutions have done it successfully. Institutions are also concerned about faculty ownership and the resultant possibility of conflict of interest or competition. However, Kelly (2000) found that there are far more institutions where ownership resides with the faculty member; which is more in line with traditional policy on intellectual property in higher education in the US.

Kelly (2000) found that most institutions and their faculty think the central question is ownership. However, the essential question is what rights each party takes away from the transaction. In a study commissioned by the Association of American Universities, AAU (1999) found in the case of the University of Maryland System's revised policy, which includes the 13 campuses of the University of Maryland, ownership resides with the faculty member for traditional scholarly works developed using "usual and customary" resources. Kelly (2000) recommended the following: that administration and the faculty need to come to agreement on the issues of ownership if the policy is to be useful and viable for all concerned; the policy needs to explicitly state the underlying assumptions concerning ownership in the policy. The policy needs to answer questions such as: who has ownership of intellectual property according to the policy? The policy needs to define how ownership will be shared and under what circumstances. The study also provided three categories of models of ownership of courseware.





## **Motivation**

Shavelson and Stern (1981) state that when lecturing, emphasis is on input of materials taught whilst when teaching, what students are taught facilitate their development. During lectures there is concentration on conveying the up-to-date knowledge whereas class teaching concentrates on the students according to whose needs and abilities they tailor the lesson plan. The study distinguished between teaching and lecturing alongside the factors aforementioned.

Scheidecker and Freeman (1999) describe motivation as a multi-faceted notion that is complex making it such an interesting and challenging issue. They observe that motivation is, without question, the most complex and challenging issue facing teachers today (Scheidecker and Freeman, 1999 p. 116). Motivation determines the extent of active, personal involvement in an activity. In every-day life, we usually use the term when we want to explain why people think and behave as they do. Menyhart (2008) and Dörnyei (2001) argue that teaching itself is a type of human behavior; therefore, general models of motivation must be applicable to describe it. Consequently, Dörnyei (2001) claim that motivation to teach determines why people decide to teach, how persistent they are, and how much effort they put into it.

## **Courseware Development Models**

Models help to conceptualize representations of concepts by providing simpler representations of more complex forms and processes (Gustafson & Branch, 1997). Therefore, it is not surprising that there is a plethora of models for instructional development, because they are, by nature, complex processes. Seels & Richey (1994) defined instructional development as “an organized procedure that includes the steps of analyzing, designing, developing, implementing, and evaluating instruction” (p. 31). Because a model offers a simpler way for conceptualization and “an organized procedure”, adopting it makes then development more amenable to proper project management treatment. However, it is important that a useful model is adopted to guide instructional development, as a misfit renders the model more of a hindrance than a help. Gustafson and Branch (1997) proposed a classification for instructional development models based on the orientation of the models, which could be: classroom orientation, product orientation or system orientation. Models that fit this project better should be product-oriented, and the two models chosen for this project were Rapid Prototyping Model by Tripp and Bichelmeyer (1990) and the Leshin, Pollock and Reigeluth (1992) Model. The Rapid Prototyping Model, is the main model to guide Phase 1 and 2. It fits well with prototyping as a strategy to achieve incremental successes. By Phase 3, the project dynamics and the instructional design will be more established. The use of prototypes can be minimized and a linear model may be more desirable. The Leshin, Pollock and Reigeluth (1992) Model, which is a more linear model, may serve this final phase better.

Georgiadou and Higgett (1998) in a study on the design of web based hypermedia courseware in higher education stated that it appeared that Web-based instructional authors had not had access to an instructional model, which had been empirically tested, because most of the studies in this area were exploratory since this medium was so new in education. However, there was a large body of knowledge in the field of instructional design from which one could draw suitable conclusions for the design process of Web-based educational hypermedia. The study recommended that a precondition for effective Web-based courseware design in higher education was careful consideration of the traditional body of knowledge in the field of instructional design which should act as a foundation for future developments in the design process. This body of knowledge included theories of instruction and courseware design factors that concern hypermedia structure, learner control, feedback, interactivity, and screen design elements. The findings of the empirical study proposed a framework of five stages that included: a review of the area of instructional design in order to identify design and development considerations potentially



applicable to the development of Web-based courseware that aims to support the delivery of physical modules in higher education; an evaluation at end of each of the stages; at the stage of technological development complex graphics and video should be used sparingly because current bandwidth limitations results in unacceptable download times for multimedia rich elements which frustrate the learning process.

### **Methodology**

The study chose a pure quantitative method using descriptive survey approach. A questionnaire is used for data collection. The questionnaire was developed with items adapted from previous related studies. The questionnaire was trail tested. Data collected was analyzed so as to determine their validity and reliability. A test-retest reliability was embarked upon to determine the reliability of the questionnaire. A statistical package for social sciences (SPSS) was also used to analyze the data and method of analysis included: percentages and frequency count. An evaluation of the web link and available resources on the pages for open courseware on the university website (University of Ilorin) was taken to know faculty perceptions about them and if they and other factors motivated faculty to contribute to courseware development.

### **Population and Sample**

All faculty staff of the University of Ilorin, Nigeria were invited to respond to the online survey (n=812). All faculty members were sent invitations to their email accounts in August 2011 to participate in the survey. The emails contained web link to the online survey and reminders/follow up mails were sent to all faculty emails on a weekly basis till 31 August 2011. The data collection spanned over 4 weeks. The questionnaire was developed by the researcher based on a review of literature and a careful observation and analysis of those features in UNILORIN courseware that are available to the population. There was a response rate of 22% to the survey (n=180) which met the desired sample size of 82 (Isreal, 2003). Data was collected mostly with a 3-point likert scale measurement and validated by Davis (1989). There were a total of five different scales for this study, with four of them using the Likert or Likert-type scales and one of them using the check-all-that-apply type of scale. The four Likert scales are the Perception of Open Courseware (OCW) scale, Factor analysis of faculty teaching beliefs, the Motivators of Courseware scale, the barriers of OCW scale and the scale on the degree of usefulness of OCW on the UNILORIN web link to open courseware. The check-all-that-apply scale was used to collect data on the usage of open courseware features.

### **Reliability**

The rating scale items on the questionnaire were tested post-data collection for internal consistency reliability, using Cronbach's alpha reliability coefficient. The alpha reliability value stood at .763 indicating that the data collected via the rating scales show satisfactory reliability, in excess of the 0.70 level routinely considered adequate for survey instrument items (DeVellis, 1991).

### **Findings and discussion**

#### **Demographics**

A closer observation indicated that out of the 180 respondents only 13 had no experience with courseware development and their status showed they were staff engaged in the period less than a year. Demographic information included experience with courseware development, seminars attended on courseware development, number of years in teaching, status, the number of classes taught per semester, the method



of conducting the class (face-to-face, simulation, online, etc),. 180 responses were received and analyzed using SPSS. The analysis of demographic information included the respondents who were experienced with courseware development, 13 who had no experience and 34 others who had developed courseware at one point or the other but who indicated that they did not use courseware in the teaching of their courses.

**Table 1 Years of experience with Open Courseware (OCW) (n=180)**

No of years	Frequency	%
No Experience	13	7.2
1 yr or less	17	9.4
2 – 4 yrs	124	68.9
5 – more	24	13.3
I do not know	2	1.1

**Table 2 Number of Years of Teaching Experience**

Years	Frequency
Less than 2 years	19
2 – 4 years	97
5 – 7 years	21
8 – 10 years	20
11 years and above	23

**Table 3 Number of Respondents by Faculty (n=180)**

Faculty	No of respondents
Agriculture	31
Arts	17
Basic & medical sciences	13
Business & Social Sciences	19
Communication & Info. Sciences	40
Clinical Sciences	4
Education	21
Engineering & Technology	9
Law	12
Science	14
Veterinary Medicine	0
Pharmaceutical Sc.	0

**Table 4 Status of Respondents (n=180)**

Rank	No of Respondents	%
Graduate Assistant to Lecturer I	102	56.7
Senior Lecturer to Reader	59	32.7
Professor	19	10.6

**Perception and Values faculty place on Development/Use of open courseware development (n= 180-13=167)**



Faculty was asked to respond to extent in which they agreed to some statements made as answers to questions they were asked. Room was left for them to make additional comments. Issues investigated included the potential impact of the use of open courseware on learning and faculty teaching, the challenges and need for support system that faculty associate with their development and use of open courseware. Some of the questions were:

1. What training do you need to support courseware development?
2. What are the challenges you face in courseware development and use in your teaching?
3. How do you observe use of courseware in assisting students to learn?
4. In your teaching, is use of open courseware helpful?

### Teaching Beliefs of Faculty

Some of the questions (with options) asked respondents are below

1. To what extent do you see the following as potential impacts of using open courseware on student learning?
2. To what extent do you see the following as potential impacts of developing/using open courseware on your teaching?
3. To what extent do you see the following as challenges in developing/using open courseware?
4. To what extent would you need the following support systems to better develop/use open courseware?

A section of the question was on faculty teaching and was developed and validated by two experts in the field from the faculty of education to assess teacher-centered, learner-centered, and learning-centered beliefs (adapted from several related studies such as: Avraamidou, Lucy and Zembal-Saul, 2003; Cho and Brown, 2007; Barkley, 2001). The questionnaire is comprised of three subscales, teacher-centered beliefs, learner-centered beliefs, and learning-centered beliefs. As for the construct validity of the measure, a factor analysis was performed using the principal axis-factoring, extraction method. As predicted, a three-factor structure was found. Factor loadings are displayed in Table below

**Table 5 Factor Analysis Results of Faculty Teaching Beliefs**

	<b>Learner Centred</b>	<b>Faculty Centred</b>	<b>Learning Centred</b>
I encourage learners to constantly check their own understanding while they are studying.	.655		
When evaluating learners, it is important to consider multiple approaches	.682		
It is important to help learners ponder on their thinking and learning processes.	.645		
Effective teachers consider students' prior knowledge/experience.	.609		
I give avenue for learners to discuss their development of understanding of concepts.	.570		
Giving lectures is important because they model subject matter expertise		.741	
I focus mainly on information students will need to pass the tests/exams.		.739	
Tests should have clear and correct answers.		.724	
My methods of grading are mainly on tests and assignments.		.721	
I use textbooks to plan my course.		.541	
It is important to present basic knowledge to students.		.538	
Many of my assignments require students to work in groups/teams.			.921



I grade students' team work skills.			.719
My course activities usually require students to work individually.		.361	-.678
I encourage students to work together to solve authentic problems that students help identify.			.647
I provide opportunities for my students to critique each others' work.			.581

### Faculty perceptions and values of the use/development of Open Courseware

#### 1) How do you see courseware helping your students learn?

Some faculty did not see any value of developing or using open courseware in their teaching and learning. Even though, many faculty perceived that use of courseware helped learners collect and exhibit their learning while some faculty viewed the value of courseware as helping students self-pace their learning, set personal goals and evaluate their progress. A few members of faculty reported the interactive and collaborative aspects of use of courseware by forms of group learning, team assignments and good communication amongst students on one hand and between students and faculty.

#### 2) How do you see use of courseware as a help in your classes?

Faculty perceived values of using technology as a teaching tool and reported that courseware helped them to assess their own teaching practices, revise course planning, learn about student experience and learning progress, and increase opportunities to collaborate with other faculty. Some faculty reported that the use of courseware allowed them to expand time and place in teaching by sharing even for an audience outside the four walls of the classroom. Some faculty pointed out negative aspects of using courseware as a teaching tool, reporting that courseware made it time-consuming and course planning more complex.

### Perceived Degree of Usefulness of Courseware in Teaching

This consists of similar 3- Likert-scale items as above. There are 10 items that represent very common features of open courseware. The results show the degree of usefulness of the University of Ilorin (UNILORIN) open courseware. The 10 items were divided up in three sections of aesthetics/graphical features, features for instruction/teaching and thirdly communication/participatory features. Respondents were asked if they found any specific features useful in teaching of their courses (from the three broad features) by selecting either 'Disagree', 'Undecided' or 'Disagree'. The 'Undecided' has a value of 0. The mean score indicated that on the average, the respondents agreed that the three common features of courseware were moderately useful in their teaching. Further comparison among the three different groups of features, classified in this study as interactive, visual and instructional, indicated that instructional and interactive features were perceived as more useful in their teaching of learners by the respondents and visual features less useful. The table below illustrates the distribution of the averaged scores for the perceived usefulness of the overall features and by group. The table 8 below illustrates only the items that were responded to out of the 10 items listed.

**Table 6: Perceived Degree of Usefulness**

Courseware Features	Overall Average Score
Aesthetics/Graphical	0.53
Images, colours	0.01
Interactive – groupware, groupmail, discussion	5.5



forum, wikis, blogs, emailing, chat, online communities	
Course Documents	3.54
Instruction/Teaching Features	4.1

### Use of Courseware and Other Learning Management Technologies in Teaching

With such consideration as, what technologies do faculty use in their teaching? The very first question that the faculty needed to respond to was whether or not they had used courseware before in their teaching. If the answer was affirmative, then they may proceed with the rest of the survey. In the case when the answer was not an affirmative one, they were asked to specify the other types of computer technology, including other learning management software or tools besides opencourseware that they may have used or are using in their teaching. A total of 70% of respondents had never used courseware in their teaching. Of this percentage (70%) most belonged to junior faculty positions. 2% had used it before at institutions other than the University of Ilorin, Nigeria (UNILORIN) and were from only the faculties of Arts and Clinical Sciences.

**Table 7: Faculty contributions to courseware development along lines of discipline** (Source: University of Ilorin website link to open courseware, August 2011).

Faculty	No of Respondents	Total No of Courses in Faculty	No of Courseware Developed (for courses) by Respondents available on UNILORIN Website
Agriculture	31	193	6
Arts	17	633	3
Basic & medical sciences	13	93	0
Business & Social Sciences	19	350	0
Communication & Info. Sciences	40	256	12
Clinical Sciences	4	0	0
Education	21	270	0
Engineering & Technology	9	249	0
Law	12	107	5
Science	14	429	0

**Table 8: Faculty reasons for developing or not developing open courseware available on UNILORIN website (n=167)**

	Agree	Undecided	Disagree
For easy access to my course materials for students and others	165	2	0
For publicity of my work, research and teaching areas/specialization	105	34	28
Posting courseware for my courses on publicly accessible UNILORIN website will enlarge the readership of the	141	10	16



materials			
Posting courseware for my courses on UNILORIN website allows other scholars to access materials they could not otherwise use	156	5	6
Posting courseware for my courses on UNILORIN website will adversely affect my promotion or career	0	0	167
Courseware or teaching materials held online are not preserved/archived properly	98	13	56
Teaching materials publicly accessible are not maintained securely	23	9	35
Copyright is infringed upon by my making available online courseware for my courses	98	5	64
It is improper for virtually anybody to access my intellectual work – courseware online on the UNILORIN website	111	4	52
If I develop courseware for all my courses make them available on the UNILORIN website readers may plagiarize or fail to cite my work	87	11	69
In my field it is common to make teaching materials and even research work available on publicly accessible websites	143	3	21
My decision to develop/make or not make courseware for my courses available on the UNILORIN website was influenced by my fellow lecturers (team teaching) and collaborators	45	12	110
My decision to develop/ make or not make courseware for my courses available was influenced by university administration, department/faculty	56	29	82

### Perceived Barriers to Courseware Development

**Table 9**

Time to learn new system	Courseware cannot be developed for my discipline
Lack of financial motivation (stipends, etc) for courseware development	Concern about increase in faculty workload
Lack of non-financial motivation	Lack of Internet access
Time for development of courseware	Lack of materials to develop courseware
Too tight schedule, no time	Issues of ownership rights/copyright infringement on my intellectual property
Resistance to change	Lack of encouragement from colleagues
Student resistance	Lack of electricity
Lack of time to learn/use/develop it	Lack of clear direction on how to use it
Lack of Departmental support	Lack of pedagogical rationale for using courseware
Lack of regular training and workshops on courseware development	Rigid courseware template from UNILORIN courseware committee
Technology issues – lack of skills and IT support	



Table 9 above shows the variety of responses of faculty to multiple choice questions regarding their perceived challenges of courseware development and use. Time and lack of motivation emerged as the most common challenging issues in relation to courseware development and use. Another challenging issue involves issues of ownership rights (whether ownership is by institution or the individual lecturers who took time off to develop the courseware made available to the public) and then complaints about the template adopted for use which some said was too rigid (respondents were asked to add their own comments). Two other respondents (in their additional comments column on the questionnaire) said they felt put off by lack of multimedia – audio, video and images on the courseware.

### **Implications**

Findings show that faculty have wide ranging perceptions of the value of courseware use and development such as a learning tools, good for students' review, self-learning to name but a few. The faculty that participated in the survey highlighted outstanding features of the UNILORIN open courseware to include communication and collaborative tools such as email lists, groupware, discussion forums and online communities. These findings are similar to several studies (McMahon, 1997; O'Reilly, 2005; Weller, 2006; Cantoni, Cellario and Porta, 2003) that the Web is an ideal forum for constructivist learning. The studies mainly see e-learning platforms such as open access courseware, Web 2.0, VLE 2.0, weblogs and wikis as social and active processes. Many lecturers in this survey shared the views of Weller (2006) and O'Reilly (2005) that courseware seemed more interactive, less static, with no programming and being user-centered or learner-centered. The findings in this study in Nigeria are similar to those of Anderson (2003), Halawi & McCarthy (2007), Heaton-Shrestha, Gipps, Edirinsingha, & Linsey (2007), Woods, Baker & Hooper (2004) on the usefulness of different features in Blackboard software. The findings from this survey in Nigeria show that lecturers who hold learner-centered or learning-centered beliefs tend to see more positive values of the use of courseware. The study found that many faculties were dissatisfied with lack of images and multimedia available on the courseware. Meanwhile, Cantoni, Cellario, and Porta (2003) emphasized the importance of visual components in the development of future e-learning systems. That study also predicted that the adoption of new interaction paradigms based on multidimensional metaphors and perceptive interfaces are a necessary direction to take in order to achieve more natural and effective e-learning experiences. Furthermore, this study on perception, motivation and factors that affect faculty to develop and use courseware found that faculty perceptions of the value of courseware use were significantly related to the faculties' teaching beliefs. This is not too different from the study by Teo, Chai & Lee (2008) that examined the possible relationship between teachers' beliefs about teaching and uses of technology. Unlike past research on this issue, the results from this study showed that belief in constructivist teaching correlates significantly with both constructivist and traditional uses of technology. A similar study by Windschitl & Sah (2002) found that the ways in which those teachers eventually integrated computers into classroom instruction were powerfully mediated by their interrelated belief systems about learners in their school, about what constituted "good teaching" in the context of the institutional culture, and about the role of technology in students' lives

### **Conclusions**

Similarly open courseware may be a richer experience for both the students and the teacher as the students have a diverse background and may contribute new ideas to the discussion. The faculty may base their success on the basis of how much the students have actually learned in the either the integration of open courseware to traditional classroom or distance learning, in the teaching process. The teachers may feel that the open courseware process is incomplete if the students do not have access to facilities like the libraries, computers etc. Due to the psychological distance introduced by the physical separation between





the student and the teacher, the students and the teacher may feel a sense of disconnect in the case of distance learning. The feeling of incompleteness is reduced in the case of integration of open courseware in traditional face to face teaching. Technological disturbances may further cause more disturbances in the teaching and learning process. Hence adequate technical support is necessary for the teachers to continue teaching in a smooth flow. The teachers may not have been provided with adequate training of how to use the technology that has been provided. Similarly, in absence of visual feedback from students the teaching process may be completely different from the teaching experience in a traditional classroom. Hence teachers should be guided in terms of pedagogy as well as policies of courseware development. The lecturers who participate in the courseware development expect support from the rest of the faculty as well as the administration. As compared to the traditional classroom teaching the teachers need to spend significantly more time and effort in the courseware development experience. There should be close coordination among the various technicians, faculty, and managers of courseware materials on the university website as open courseware development is a team effort. As said earlier, proper planning of course structure and quick feedback through the means of assignments is essential for the students and the lecturers should be aware of that fact. Declaring the course objectives and the assessment criteria helps the students and the lecturers agree on some parameters. Experience and practice improves faculty comfort, knowledge and skills required for the technology based teaching that open courseware provides. The research says that the enthusiasm and commitment of the teachers in courseware development should increase the student learning. There are also chances that faculty who are provided adequate training and are more comfortable with the courseware development and technology help the teaching during the lecture. The course has to be suited for the courseware development facility.

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