

# A Novelty in the Modes of Assessment in Open and Distance Learning Education: A Review

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**Abstract**— A critical element of teaching is the evaluation of student learning. In evaluating student learning in online settings, unique challenges arise. The previous study explored the types of evaluation approaches used in online learning and the ways in which adequate e-learning is enabled by the online environment. In order to discover the types of approaches used to measure student learning and contribute to the overall course score, syllabi from 24 online courses were analyzed. Five categories emerged: (1) written assignments; (2) online discussion; (3) fieldwork; (4) quizzes/test and exams; and (5) presentations. The findings showed that written assignment mode of assessment appeared the most frequently used (22 of the 24 courses), followed by online discussion (19 out of 24 courses), filed work (9 out of 24 courses), test/quiz and exam (8 out of 24 courses) and presentations which accounted for (5 out of 24 courses). New modes of online assessment discovered for improvement of online education are artificial intelligence, simulation, animations, portfolio, case studies, flash cards, games, and matching.

**Keywords**— Online learning, artificial intelligence, online assessment, robot, written assessment, quizzes.

## I. INTRODUCTION

On-line education is a type of education where teachers and learners are segregated (Abiodun, 2010). It is a way of presenting information to students in a classroom who are not physically present. Computer-based applications are used from a distance for individuals to operate remotely. In some institutions, synchronous learning such as Learning Management System (LMS), video conferencing, online conferencing, educational television are used, whereas asynchronous learning resources such as emails, message board boards, video and audio files, or both, have also been used by organizations. Assessments are exercises designed to test the abilities of students in a particular course's learning goals, thereby offering students the opportunity to develop their learning and provide input.

A distance learning course assessment is a very important process of course enhancement and is a measure of the course's strengths and limitations (Arun, 2010). Printing materials and student support are the most critical components of assessment in the classical mode of Open and Distance Learning (ODL) framework that lead to the success or failure of a course. Student assessments require various strategies such as written assignments, online chat, fieldwork, quizzes and presentations (Claire *et al.*, 2014). Online education has been found to have both limitations and influence, but the limitations can be worked on and made creative (Makamane,

2011). Therefore, it is important to emphasize and embrace novel modes of evaluation of online education in order to develop better ways of evaluating online students in their respective institutions.

## II. LITERATURE REVIEW AND CRITICAL ANALYSIS

Artificial intelligence has been defined as computer software that closely mimics behaviours that human beings might consider to be intelligent (Yudong *et al.*, 2014). In Open and Distance Learning (ODL), in order to develop and expand Open and Distance Learning education, Artificial Intelligence could be integrated into course management, learning management systems, support services and university general operations Yudong *et al.*, 2014. The paradigmatic change from a generic maxim to a learner-centric approach has enabled Artificial Intelligence and other types of information and communication technologies in education to use technology to facilitate individualized learning styles (Yudong *et al.*, 2014). With Artificial Intelligence, it would be possible for technologists to integrate adaptable 'human-like' features into an Open and Distance Learning environment. The ODL method, however, has become 'socio-technical' and the purpose has changed from substituting human activity to supporting human activity (Yudong *et al.*, 2014)).

Artificial intelligence can help teachers perform teaching and review tests, exams are a distinctive part of education, and they are significant milestones in the educational path of a pupil. Examinations entail a great deal of preparation, including the establishment of question papers, the printing of question papers, the distribution of question papers across all test centres, the assessment of answer sheets and the processing of results. It also takes months to complete the entire process, and it is labor-intensive. Planning for the next analysis will begin by the time one examination period is completed. This method takes teachers a lot of time and gives them more work. In reality, technology's role in education has developed a relationship of cause and effect with how courses are taught and educational services provided. As experiences with human machines become more relevant in an ODL setting, the use of machine-assisted learning is also becoming more compelling for scholars (Arun, 2010). In order to change the essence of experiences from person-machine to person(s)-person(s) with and through computers, the internet and its accompaniments have made e-learning instruments familiar (Arun, 2010). In order to achieve the optimal learning

outcome, educational technologists will continue to work towards delivering the most effective input, evaluation and interaction. Access to technology powers open and distance learning education as an evaluation, and it will not only offer flexibility but also provide learners with more benefits. Abiodun (2010) stressed that the partnership between distance learning and computer technology has given several promises to the education sector. Evidence indicates that the implementation of the proposed "Internet Technology" model and "Absolute Quality" can maximize quality, access and cost at the same time. Thus, in the open and distance education system, a better learning experience can be offered, which can be easily compared to the best.

Efficient educators, however, allow moment-to-moment comparisons of their teaching success and student learning. Those test findings were used to make decisions on, for example, re-explaining a term, presenting students with "learning questions," and so on. Rajasingham (2011), in the sense of more conventional open learning and e-learning contexts, assesses the possible challenges of emerging educational approaches. The key challenge is to build an organization that can change the paradigm from a traditional national university to a sustainable global learning framework that preserves the standard of teaching, learning processes and the use of expertise in different cultural contexts to solve real-life problems.

Barasa (2010) explores both Canada and India's growth trend in distance education and states that distance education has increased enormously. Many developments are bringing new pressure on the traditional education system, prompting many institutions to review their current policies and procedures and to change them. Arun (2010) illustrated the various advantages of distance learning and describes how the need for quality-based higher education by distance learning in a globalized society such as India is continuously growing. The author also discusses different factors that, through distance learning, lead to the growth of management education. Barasa (2010), described distance education as education provided by a method other than the conventional face-to-face method whose objectives are similar to and as noble and realistic as the traditional face-to-face environment. It is clear that, in terms of process, result and effect, the education system faces evaluation problems in various ways. One of the congenital issues in Nigeria that stresses the regurgitation of facts is the appraisal system.

Educational evaluation is a systematic method in which analytical data on information, behaviours, abilities, and values are documented and used to enhance programs and develop student learning processes. Evaluation not only helps to improve teaching and learning, but also guarantees the consistency of the teaching provided to learners. The novelty of the credibility and reliability of the Open and Distance Learning (ODL) evaluation procedure is one of the issues of debate among educational experts in Nigeria. The key types of assessment characteristics are validity, reliability and fairness, which are important for efficient evaluation (Makamane, 2011).

In order for an evaluation framework to be accurate, it is important to take care to check whether or not the objective of the evaluation has been achieved (Chaudhary and Niradhar, 2013). Reliability requires the degree to which evaluation is free of measurement errors. Fairness in evaluation refers to the objectivity of the evaluation and the removal of individual judgment from evaluation (Conrad, 2013). ODL modes of evaluation have fundamental variations between formative evaluation and summative evaluation. Formative evaluation is the method used to understand and respond to student learning by teachers and students to improve learning (Conrad, 2013). It is a planned mechanism used by the teacher and student during instruction to provide input. This helps the student to adapt to the ongoing phase of teaching and learning in order to increase the achievement of the results of learning (Jeffries, 2011). Summative evaluation, on the other hand, refers to the evaluation of participants where the result of a program is the objective. This compares with formative evaluation, which at a specific time summarizes the progress of the participants.

Summative evaluation is commonly taught in the United States in educational programs. Although all evaluation techniques can be summative, only some are formative, Makamane (2011) reported. There is consensus among appraisal proponents that successful evaluation should be ongoing and based on enhancing the learning of students (Lorna, 2012). Lorna (2012) was concerned that most appraisal efforts have led to little change in learning because they are applied without a clear view of what "higher" or "deeper" learning is and without the knowledge of how such learning can be facilitated through appraisal. Brown and Knight (2004), who suggest that appraisal approaches work best when learning results have been communicated in advance, discussed with the learners, and decided on evaluation criteria. Authors equate the views of facilitator practices from online teachers with their own accounts of their practices and activities by facilitators. A qualitative review of facilitators' end-of - course interview data was conducted. Murugan (2011) reported that the quality issues of the ODL system are not identical with those of campus education, with a view to developing quality metrics in both systems. In conclusion, a detailed account of the quality standards as they relate to the various activities that fall under the focus area is provided. Makamane (2011) explores Quality Assurance in Open and Distance Learning and discovers that the policy structure for ensuring quality in education has evolved over the years and attempts have been made to achieve it.

### III. METHODS OF EVALUATION OF ONLINE LEARNING

Few studies have published on the types and distribution of tests used in an online course by teachers to lead to the overall grades of students. Swan (2001) reviewed 73 online courses and described methods involving conversation, reports, other written tasks, quizzes, exams, projects, and group work. Nearly three quarters of the courses used online discussion as a graded practice, according to the study. About half of the courses used written tasks and tests or quizzes.

Similar evaluations and results were carried out by Arend (2007) in a review that examined 60 courses. Online

conversation, tests, written assignments, experimental assignments, problem assignments, quizzes, projects, papers, and presentations are the methods defined. Arend (2007) found that a substantial proportion of the courses used online conversation as a graded task. In 83% of the courses and 63% of the written assignments, assessments and quizzes were used.

Five (5) types of assessment of online learning were also stated by Lorna (2012), including: 1) Written assignment: This broad category includes assignments such as research articles, case-study responses, and short essays; 2) Online conversation: This also includes asynchronous discussion operation carried out on a discussion board, journal, or wiki; 3) Fieldwork: This is a typical style of evaluation consisting of multiple-choice or short-response questions; 5) Presentation: Student presentations provide evaluations in this category; the format of presentation delivery should be adapted to the online world. According to him, the most commonly used appraisal was the written task, with 22 out of 24 courses using it for at least one of their evaluations. These tasks were open ended in the category of test / quiz / exam and often gave students some choice of subject. They were, however, usually more formal than debate online. Research papers and case-study responses were two frequent subcategories. Students were often assigned into small groups, as with online discussion, and often needed to provide peer input on written work. Written assignments contributed an average of 52%, with a range of 10% to 100%, to the overall course score. Written tasks were submitted electronically via the Course Management System (CMS) most of the time, while students were asked to apply the

assignments to the tutor's e-mail in a few instances. Online discussion has been used as an evaluation tool in 19 of the 24 courses.

On the CMS's discussion board, most online discussions were held, though few courses used wiki and blog resources for this purpose. Students were asked to respond to questions about a reading they had to complete or a video they were expected to watch in certain discussions. For their debates, students were often put into small groups. Some courses called for students to take turns moderating the debate, and some used internet discussion as a way for students to provide input on assignments to each other. The average contribution this approach made to the overall course grade was 32 percent, with a broad range from a low of 4 percent to a high of 80 percent, in courses in which online debate was assessed. Fieldwork is a specific type of written assignment in which students perform some kind of data collection and/or experience in the field, which they then report in written form. Out of the 24 courses, nine (9) used fieldwork for evaluation. On average, with a range of 10 percent to 50 percent, it contributed 28 percent to the overall course ranking. Traditional assessments and quizzes include the test / quiz / exam type. Of the 24 courses, eight (8) used evaluations of this kind. Students have been asked to take the exam at a proctored test site in certain instances. On paper or online, proctored tests were administered; unproctored tests inside the CMS were taken online. The average weight of the overall course grade contributed by this group was 44 percent, varying from a low of 6 percent to a high of 100 percent. The final group constitutes student presentations.

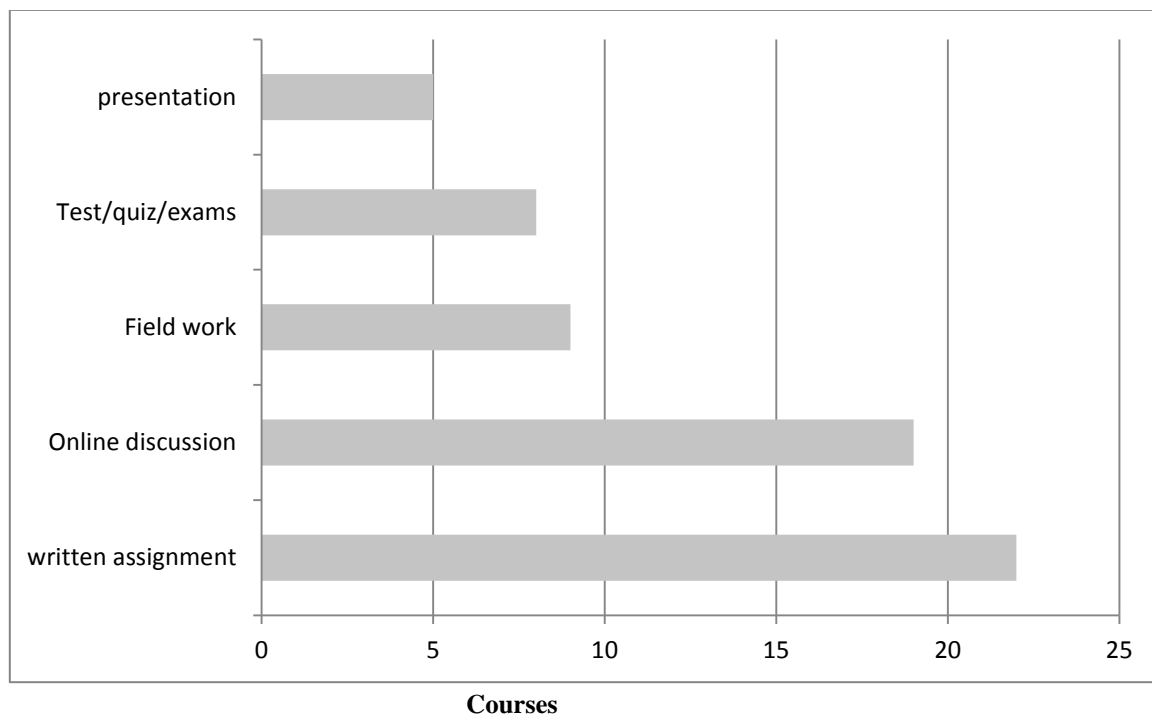


Figure 1: Assessment categories  
Source: Gaytan and McEwen (2007)

In most instances where this form of appraisal was used, what the student had presented in a final project was summarized in the presentation task. The students have used Microsoft Power Point to create the presentation, often as a series of slides and sometimes as a poster. As networking channels, wikis, message boards, and synchronous webinar sessions were utilized Claire *et al.*, (2011). Written assignments and online conversation emerged most commonly among the five groups, with 22 of the 24 courses using the former and 19 using the latter. Both of these approaches were present in 18 of the 24 courses. The presentation, with five out of 24 courses, was the least used. There were two or three distinct forms of evaluation used for the majority of courses. Three courses used only one form, either written assignment or test / quiz / exam, while all five methods were used for only one course.

### *Strengths and Limitations of Online Learning*

In higher education today, there are several explanations why online programs have become a common method of distance learning. Students, if they have a computer and internet access, can easily participate in classes from a distance. Furthermore, the online format provides freedom for physically disabled students (and teachers) to engage in class. Instead of having to "go to class" physically, learners engage in the classroom through their computers (Nyaruwata, 2011).

Another strength brought about by the online learning format is time quality. At any time of day or night, students can access their courses. In addition, students have continuous access to tutorials, materials for the course, and class discussions. For anyone who may need to take longer to focus on any content before moving on, this is very handy. The online format provides space for contact between the teacher and students and between the students themselves. Resources and ideas are shared, and the learning process can create continuous synergy. Ideally, learners make their own individual contributions to the course while taking away a special combination of data that is important to their needs at the same time. Today's learners have access to tools and materials that can be physically found anywhere in the world, according to Open and Distance Learning reviewers. A resource center with links to academic papers and other resources related to the course outlines can be consulted online by a teacher for students to access research and studies (Nyaruwata, 2011).

There are vulnerabilities inherent in the use of this medium in terms of the drawbacks in online learning that can pose possible challenges to the performance of any online program (Conrad, 2013). Accessibility to technology and technological know-how are among these issues. It must have students who can access the online learning atmosphere before any online program can succeed. It is not universal in terms of Internet connectivity and, in certain parts of the United States and other countries, Internet access is a major expense to the user. For their Internet access, some users pay a fixed monthly fee, while others are paid for the time they spend online. If the online time of the participants is restricted by the amount of internet access they can afford, then for all students in the

course, training and participation in the online program would not be equal. This is a restriction on online programs that rely on access to the internet.

Moreover, in order to work effectively in an online environment, both students and facilitators must possess a minimum degree of computer knowledge. They need to be able to use a range of search engines, for instance, and to be comfortable accessing the World Wide Web. They cannot excel in an online program if they do not have these technological tools; the whole program will be weighed down by a student or faculty member who cannot work on the framework. If the facilitators are not sufficiently trained to work in the Virtual Classroom, an online curriculum is undermined. By establishing a welcoming atmosphere in the Virtual Classroom where all students feel comfortable participating, and particularly where students know that their instructor is available, an online teacher must be able to compensate for the lack of physical presence.

### *Latest approaches for Online Evaluation*

Every good evaluation begins with a clearly stated purpose and a specific set of questions to be answered. These questions drive the evaluation approach and help determine the specific data collection techniques that evaluators will use. In addition to traditional online evaluation methods such as written evaluation, online conversation, field work, quiz/test/exams/and presentation, there are several modern online evaluation methods to improve existing methods, including simulation, animations, portfolio, case studies, flash cards, sports, matching, artificial intelligence, robot use, and many more to help teach and evaluate. There are two types of evaluations that are often used relating to purpose of evaluation, including formative evaluation and summative evaluation. Formative evaluations are usually conducted during development and implementation of the learning program and it is mainly to improve the learning program (Shidong, 2011). Summative evaluations on the other hand, mainly focus on the impact of a learning program, sometimes referred to as outcome evaluations.

According to Yudong Zhang *et al.* (2014) evaluations are classified as process, impact and outcome evaluations. Process evaluation mainly assesses delivery of the learning program, its quality, and satisfaction of participants. However, impact evaluation mainly focuses on the short-term effects of the learning program. It assesses whether the learning were met the objectives of the learning program or not. The last evaluation step is outcome evaluation. It mainly focuses on the longer-term impacts of the learning program.

This evaluation assesses the extent to which the goals of learning program have been achieved. According to Renkun *et al.* (2011), "outcome evaluations are typically conducted after training has been completed. Evaluation at this level is designed to assess change in participants' work practices, and the factors that influence participants' capacity to transfer their training to work practice".

In general, there are several learning program evaluation models that can be applied for online learning. Thus, choosing



an evaluation model that is suitable for the objectives is necessary.

### 1. Objectives-oriented evaluation

According to Renkun (2011), Objectives-oriented evaluation is to compare learning results to online learning objectives. From this approach, we can determine whether the objectives are being met or not. In addition, it can help determine whether objectives are appropriate or not. Moreover, the objectives can be used as a comparative benchmark between online learning and other learning methods. Objectives-oriented evaluation is sometimes called goal-driven evaluation.

An objectives-oriented approach can exist in two levels of objectives. The first level is instructional objectives for learners. That means the question “What did the learners learn?” determines these objectives. The second level is systemic objectives for learning. In this case, the question “What did the learning solve the problem?” determines the systemic objectives.

Major weaknesses of this approach include the difficulty of evaluators to operate in a program environment with ill-defined objectives, to identify unintended program outcomes, and to measure learning. Grades used to determine learning, can have little relationship to what students learned when they have already known the material. Also according to Makamane (2011), grades may not be a reliable measure of learning, performance tests in particular, as different teachers will not likely assign grades in a consistent manner. Therefore, using grades to measure learning can be problematic.

### 2. CIPP model

CIPP stands for evaluations of context, inputs, processes, and products. The CIPP is sometimes called a management-oriented model. It examines the online learning within its larger system or context. The CIPP model is considered as a comprehensive framework using both formative and summative evaluations. This model was presented by Stufflebeam (2003) as follows: “Context evaluations assess needs, problems, assets, and opportunities to help decision makers define goals and priorities and help the broader group of users judge goals, priorities, and outcomes” (Stufflebeam, 2003). Applying for online learning, context addresses the environment in which online learning takes place. It compares the real environment of online learning to the ideal.

However, it uncovers systemic problems that may dampen online learning success, including technology breakdowns and inadequate computer systems. “Input evaluations assess alternative approaches, competing action plans, staffing plans, and budgets for their feasibility and potential cost-effectiveness to meet targeted needs and achieve goals” (Stufflebeam, 2003). Applying for online learning, input examines which resources are put into online learning. It also examines whether the content is correct or not, and whether combination of media has used or not. However, input uncovers instructional design issues.

“Process evaluations assess the implementation of plans to help staff carry out activities and later help the broad group of users judge program performance and interpret outcomes”

(Stufflebeam, 2003). In online learning, it examines how well the implementation works.

However, it also uncovers implementation issues. “Product evaluations identify and assess outcomes - intended and unintended, short term and long term - both to help a staff keep an enterprise focused on achieving important outcomes and ultimately to help the broader group of users gauge the effort’s success in meeting targeted needs” (Stufflebeam, 2003). With respect to online learning, product addresses outcomes of the learning through the questions such as “Did the learners learn? How do we know? Does the online learning have an effect on workflow or productivity?” It also uncovers systemic problems.

### 3. Kirkpatrick’s evaluation model

The most common used model of evaluation was identified based on the learning program goals is four-levels model developed by Kurt (2016). The model includes four levels of measurement to assess reaction, learning, behavior, and results. Although the Kirkpatrick model has been applied to traditional learning for a long time, recently it has been applied to online learning.

## IV. CONCLUSIONS

As it is no longer used for grading and certification, assessment is an important part of the learning process; rather, it has been related to student learning and ability development. Assessment is closely related to the learning experience of students. The peculiar nature of the ODL system makes evaluation complex and, as such, raises the challenge of maintaining the standard of learning, especially when compared to the face-to-face learning mode. The ODL schemes should therefore ensure that students earn marks/grades in accordance with their competence to ensure this. In addition, despite performing better, it should not make them feel neglected and de-motivated by earning a lower grade. The evaluation of the ODL system (like any other learning system) should test the objectives of the course. Assessment tools based on information communication technology, such as artificial intelligence which includes robots and animations, should be promoted on a large scale for establishing a student friendly and innovative practice of assessment in ODL system.

### Author contribution

Osunbade O.A: Conceptualization (equal); Writing-original draft (lead); Writing-review & editing (lead). Adeoye M.A: Conceptualization (equal); Writing-original draft (lead); Writing-review & editing (supporting). Aruwaji, M.A: Conceptualization (equal); Writing-original draft (supporting); Writing-review & editing (equal). Olorunnisola A.O: Conceptualization (supporting); Writing-original draft (supporting); Writing-review & editing (supporting). Badmus T.A: Conceptualization (supporting); Writing-review & editing (supporting); Arulogun, O.T: Conceptualization (supporting); Writing-review & editing (lead). Akanbi, R.Y: Conceptualization (supporting); Writing-review & editing (supporting), Olajire, S.O: Conceptualization (supporting); Writing-review & editing (supporting), Fajobi, J.T:

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