ONLINE EVALUATION: A VIABLE ALTERNATIVE FOR CONTEMPORARY TIMES

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ABSTRACT
The immediate adoption of online methods of teaching, learning, and evaluation is imperative for survival in the Digital Age. An attempt has been made to highlight the need for the shift to online methods of evaluation and suggest appropriate model based on existing practices in different countries. The existing online examination models have been identified and reviewed doing a SWOC (Strengths, Weaknesses, Opportunities and Challenges) analysis. Based on which, an Online Student Evaluation Model has been developed suitable for Open and Distance Learning (ODL) institutions that cater to the educational requirements of an abnormally large number of learners who are geographically dispersed and heterogeneous; and include disadvantaged and marginalized sections.
Keywords: Online Evaluation, Assessment Tools, Formative, Summative, Assessment Models

Introduction
The winds of socio-economic change have ushered in a new era representing innovation and change through the introduction of online learning and digitalization of operations to provide lifelong learning opportunities and services to all. Rising unemployment, requirements of skilled manpower, upskilling/reskilling of the workforce, shifts in societal expectations and the enormous capabilities of ICT are pushing institutions of higher learning to go online. Thus, the digital transformation of the teaching-learning process in the Digital Age, presents a dramatic shift in the educational paradigm from a teacher-centred to a learner-centred approach of open and flexible learning. Low-cost mobile computing devices; cloud-based computing; Open Educational Resources (OER); Massive Open Online Courses (MOOCs); virtual reality and virtual worlds (Second Life; augmented reality; virtual labs; robotics; artificial intelligence; machine learning; etc.) are some of the key trends which have emerged across global higher education sector.

While a lot of people attribute formal assessments and examinations to Henry Fischel, an American businessman and philanthropist, however the standardized tests first were introduced in China. The need for a standardized examination system originated in ancient China centuries ago (by the Sui Dynasty in 605AD), which implemented a standardized examination called "Imperial Examination" for the purpose of selecting suitable candidates for specific governmental positions. Interestingly, the imperial examination was abolished by the Qing Dynasty 1300 years later in 1905. Similarly, England adopted this examination system in 1806 to select specific candidates for positions in Her Majesty's Civil Service. This examination system was later applied to Education and it started to influence other parts of the world as it became a prominent standard (e.g. regulations to prevent the markers from knowing the identity of candidates) of delivering standardized tests (Prince & Bukie, 2018). These standardized tests were gradually adopted by different countries mainly for recruiting people to federal jobs. In an attempt to bring objectivity to the system, online standardized tests were adopted in many countries to avoid human error in the evaluation system.

Online standardized tests were conducted for admission to undergraduate professional degree programmes in engineering and architecture in 2002, formerly known as All India Engineering Entrance Examination (AIEEE), which was renamed in 2013 as the Joint Entrance Examination - Main and Advanced (JEE Main, JEE Advanced); Common Law Admission Test (CLAT) for Law degree programmes; and National Eligibility cum Entrance Test (NEET) for medical/Dental degree programmes. The Government of India established the National Testing Agency (NTA) in 2017 for conducting national level common entrance tests for professional and non-professional programmes of study. According to a 2017 report of Google and KPMG, e-learning in India is set to grow to $1.96 billion business and the user base will reach 1.9 million by 2021 (KPMG & Google, 2017).

Need for Online Evaluation
Evaluation is an important aspect of any educational system. A foolproof evaluation system which is not only quantitative but also qualitative in nature can project the actual picture of learning outcomes of any educational institution. Evaluation process should be based on all three domains of learning *viz.* cognitive, affective and psychomotor, but the present evaluation system only focuses on the cognitive domain. In India, the system of education including evaluation has not changed since ages. Evaluation system in India is still practicing the primitive strategies and old techniques which may be successful during certain periods, but in the Digital Age with the availability of several technological options, a shift in paradigm is not just a need but demand of the millennial society. There are a number of indicators that are clearly pointing to the need for reform in the evaluation system which have been detailed below:

a) **Infrastructure constraints:** Being the second largest country in the world population-wise and the youngest nation, the biggest constraint is to cater such a huge population with limited resources. There are very few Higher Education Institutions (HEIs) in the country generally located in the major cities, so aspirants residing in rural areas or far-flung areas have to migrate from their native place to these cities. Since it is not feasible for everyone, some of them just drop-out from the system. There is an option of Open and Distance Learning (ODL) for such candidates but for examinations, they have to visit the exam centre which may be far away from their place. On the other hand, there are some specific target groups, such as employed persons, defence and paramilitary personnel, PwDs etc. who may find it difficult to attend examinations held at exam centres. The online examination is the only answer to overcome such hurdles.

b) **Financial burden on HEIs:** To conduct examinations either annually or biannually dedicated department is required. The department is responsible for exam-related activities like Question paper setting, moderation, printing; conduct of examination; maintaining the sanctity of examination; evaluation of answer scripts; compilation and declaration of result and organizing convocation annually in some institutes. To perform all such activities, there is a requirement of huge manpower, which needs a handsome amount of budget in the total expenditure of HEI. Online examinations can reduce the budget by limiting the operational expenditure towards manpower, eliminating the costs of printing question papers and answer scripts and the costs involved in sending and collecting them from examination centres, manual evaluation, etc.

c) **Issues related to conduct of examinations:** Conducting examinations under the present scenario not only put financial burden on HEI but there are many other constraints that are difficult to control like transportation and security of question papers and answer scripts, misprinting or error in printing of question paper, natural calamities/disasters/ epidemics/pandemics etc.; leading to either rescheduling/cancellation of examination or providing grace/extra marks to learners. Since paper setting, moderation, printing of question papers and answer scripts, dispatch to exam centers and other exam related activities are interrelated and time bound, delay even in one activity leads to delay in the whole process. Therefore, utmost care is required to adhere to the timeline, which is a tedious job in itself.

d) **Malpractices and security issues:** The country is encountering leakage of question papers which is a big challenge to our examination system. From the setting of the question paper till it reaches the examinee, it moves through a number of channels. Hence, there are chances of leakage of question paper at any point during this process. Further, malpractices in examination like copying from study material and fellow examinee; use of technology for copying and sometimes mass copying; tempering with admit card; impersonation; tempering with answer script which also raise questions on integrity of examination centre. Malpractices are not only restricted to exam centres but sometimes also found in the examination department of HEI like replacing the original answer script with duplicate or making corrections in the answers scripts before evaluation and tempering the marks or grades after evaluation, issuance or creation of fake degree certificates etc. All such malpractices not only threaten the sanctity of the examination process but also injustice to meritorious and deserving learners who work hard the whole year for the examinations.

e) **Cancellation of Exams:** Sometimes, HEI has to cancel the exam of a particular subject/course due to leakage of papers or other unavoidable reasons like, natural calamity, riots etc. The cancellation of examinations not only puts extra financial and manpower burden on HEI, but also affects the learners adversely. Sharma (2014) also stated that "cancelation of exams adversely affects the students in many ways

like increased stress, anxiety, loss of time & money, etc. Further, due to delay in exams, students pursuing higher studies or jobs or other career opportunities may be adversely affected."

f) **Limited trained staff:** To perform exam related activities, well-trained professional and technical staff is required like data entry operators, computer operators, software and hardware professionals, system analysts, etc. But, usually the HEIs are understaffed and hence not able to place sufficient staff in the examination department. Therefore, availability of limited staff results in increased workload on the existing staff which further affects the quality of the examination process.

g) **Non-availability of adequate number of evaluators**: To maintain the database of evaluators is one of the major tasks of any examination department. But, identifying course-wise evaluators is one of the biggest challenges for HEIs now-a-days. Further, in case of OUs where enrolment is very high and the number of evaluators is comparatively less and the task is voluminous and to be completed within a stipulated time frame, non-availability of adequate number of evaluators is one of the major factors in delay of evaluation process.

h) **Delay in declaration of result:** Delay in the processing and assessment of answer scripts leads to delay in result declaration. The factors leading to delay in declaration of result are time exhausted in transporting of answer scripts from exam centre to HEI, from HEI to evaluator and back to HEI, misplacement/loss of answer script during transit, time required for manually cross-verifying the award sheet with answer scripts, followed by data entry in computers etc. Delay in declaration of results affects learners adversely like delay in further admissions, missed employment opportunity etc.

Keeping in view these constraints, there is a dire need to make a paradigm shift from the existing traditional examination system to an online examination system which allows a large number of learners to take exams at their locality/doorstep, overcome the financial and operational constraints, eliminating the human error in the examination process, control the malpractices, automated evaluation within the time-frame and faster processing and handling of data resulting in timely declaration of result. Konde *et al.* (2019) also admit that online examination has many advantages like faster handling of data, automatic and error free report generation, and reduced efforts on manual record keeping, which saves a lot of time.

We know that society changes gradually and many a time very silently, we also have facts on records of civilization that unexpected and unforeseen events like COVID-19 lead to overall social, economical and environmental change. Transformation in almost every aspect of human life is very much visible. Measures are being taken by the nation and worldwide to do damage control and salvage the existing systems during this crisis. Shifting to adoption of online technologies is the panacea in today's times. The present pandemic has triggered experiments globally with regard to online learning and evaluation. If it succeeds, it will revolutionize the whole education system. Much has been discussed on various platforms about the new age technology and its integration in the education system but the new normal brought by the COVID-19 will intensify the digital spirit of the society.

Review of Literature

Indian Government is well aware of the paradigm shift from traditional practices to incorporation of the latest digital learning in our educational system. A beginning was made by the Ministry of Human Resource Development (MHRD), Government of India issuing the Regulations regarding Massive Open Online Courses (MOOCs) in 2016 and providing an e-platform: 'SWAYAM' (Study Webs of Active Learning for Young Aspiring Minds) to all Higher Educational Institutions (HEIs) to host their online courses on it without any cost. To maintain the parameters specified in the SWAYAM Regulations and to ensure the quality in production and delivery of courses, nine National Coordinators have been appointed across the country. The online courses delivered through SWAYAM are offered free of cost to the learners and in case they require certification; they are required to register and pay a fee inorder to appear in a proctored examination. Although as per the Regulations (2016), online assessment and evaluation will be the preferred mode throughout the length and breadth of the course and even for the conduct of the final examination; but it is left to the HEIs to take a decision on the matter. HEIs are also recognizing these certificates and are providing transfer of the credits earned to the certified learners pursuing higher education at a HEI. Presently, only 20 percent of the courses are allowed to be completed through this method (Government of India, 2016).

Recently, the University Grants Commission (UGC) of India has provided a legal framework for the implementation of Online Education in the country by issuing the UGC (Online Courses or Programmes) Regulations, 2018 vide Gazette Notification No.252 on 4th July, 2018. This is a major step taken undoubtedly to bind the system and infuse quality by laying down minimum standards of instruction for the grant of degrees, diplomas and certificates through online mode (Government of India, 2018). Regarding assessment and evaluation, the Regulations (2018) state the following under Sub-regulation 7 (3) (ix): "Availability of

assessment mechanism - each course in the Online Course or Programme shall have a precise assessment mechanism for the identified learning outcomes at each level for both continuous formative and summative assessments. (x) Identified technological interface and interoperability - the Online Course or Programme shall be able to utilize a variety of technology tools, shall have a user-friendly interface and meet accessibility standards for interoperability and access for learners with special needs". Early this year, the Central Government approved the beginning of online degree courses only to open access to as many prospective learners as possible. Accessibility is a key feature of online education.

The future can be gauged from the MHRD, Government of India's draft new National Education Policy framed to meet the requirements of the changing demographic and cultural changes in the country and with the aim of making India a "Knowledge Superpower" (Government of India, 2019). In its agenda to usher in a new India, the policy recommends the use of ICT to disrupt the existing educational system in the context of improving teaching learning and evaluation processes. It recommends that "assessments can be partly online multiple-choice examinations combined with projects and other hands-on work that is evaluated separately by teachers. Some app-based multiple-choice examination systems are already available now that make it very easy for faculty to conduct quizzes". (Government of India, 2019, 19.4, p.350)

In a nutshell, at national level, there is major thrust to popularize online learning but the current status of online assessment and evaluation is still at the nascent stage. In fact, because of the introduction of MOOCs and online courses/programmes by HEIs, it is imperative for them to adopt an online evaluation system in compliance with the UGC Regulations of 2016 and 2018. HEIs are also conducting entrance examinations through the adoption of an Online Examination System (OES) themselves or outsourcing the same to professional agencies/ companies. In order to perform quick evaluation of answer sheets, the system of onscreen marking is also being adopted by many HEIs. Formative assessment through online quizzes and assignments, online discussions and debates, e-projects, e-portfolio, self-assessment exercises, etc. is also being promoted. Many HEIs including examining bodies are issuing digital certificates and transcripts to the learners. Provision is being made for storage of the certificates in digital lockers that can be used by the employers or HEIs for online verification. Similarly, Open Badges are being issued for learners on getting certificates through completion of MOOCs and other online courses.

The COVID-19 pandemic has propelled the University Grants Commission (UGC) of India to issue directives to all Higher Education Institutions to rethink their operations and shift to online methods of teaching-learning and evaluation (UGC, 2020). For example, University of Delhi (Delhi University, 2020) and YCMOU, Nasik (Jain, 2020) have adopted Open-book examination as a summative evaluation method for their learners. IK Gujral Punjab Technical University has adopted online examination using MCQ as a method of summative evaluation (Kaur, 2020).

Models of Online Evaluation

HEIs are adopting the online evaluation strategy for the entire programme or for a particular course. Even within the course, learners are being assessed online for one component (Formative or Summative). For the success of Online Evaluation, use of latest technologies is indispensable. For seamless conduct of examination, an efficient and updated Online Examination Management System is of paramount importance. Examination can be conducted using Assessment Tools in the Learning Management System (LMS) or using Online Examination Management Software independently or integrated into the LMS. Some of the assessment tools and models are depicted (Fig. 1) and discussed below:
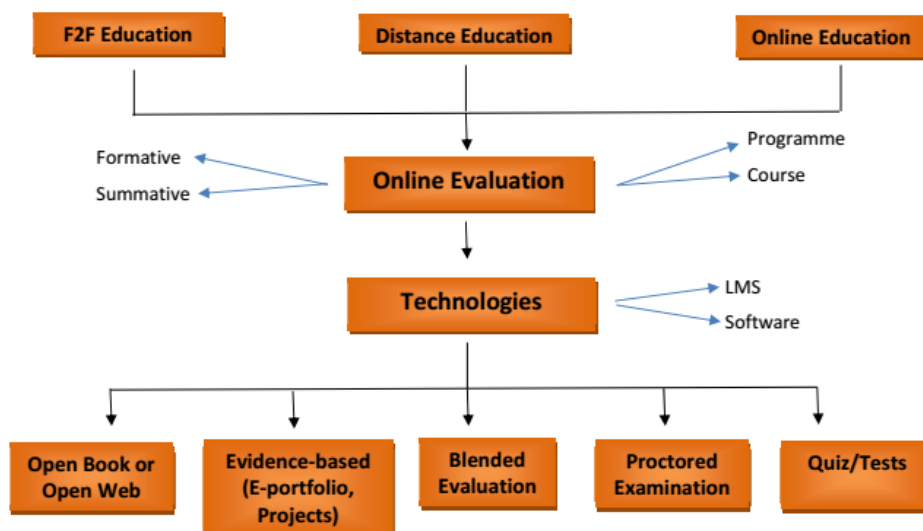
Figure 1: Assessment Tools and Models of Online Evaluation

a) **Open Book or Open Web Examination:** Open book or Open web examinations are more prevalent in the developed world. However, since many universities worldwide are becoming Dual Mode Universities, the Open Book or Open-web Examination is slowly creeping into the distance learning sector. For example, the Open University under the University of Helsinki conducts different types of examinations which include end-of-course examination, book examination and take-home examination. The Open University administers both traditional paper examinations and online examinations. A research study conducted by Myyry and Joutsenvirta (2015) at University of Helsinki on the university students' experiences of open-book, open-web online examinations revealed that "over half of the students who participated in the study reported using more time for responding and changed their learning strategies from surface learning to deep learning while preparing for an online examination when compared to a faculty examination".

b) **Evidence-based Evaluation:** Assessment of a learner's knowledge and competency can also be carried out based on the evidence submitted. For example, assessment tools like e-portfolios, project reports, Journals, Digital Badges, Group works, learning analytics etc. can demonstrate the competency of the learners in a particular subject area/topic. "Within educational institutions, portfolios have increased in popularity on many fronts. Many programs in universities have introduced portfolios as a means of assessing learners' aggregated work over the course term. Some graduate programs at Athabasca University, an open and distance University in Canada, have replaced comprehensive exams with portfolios" (Conrad and Openo, 2018).

c) **Blended Evaluation:** In order to bring in flexibility into the evaluation system, blended approaches in evaluation have been adopted by many HEIs. Blended evaluation can be viewed in terms of the types of assessment tools used or based on the component of course study. Within a programme, different evaluation strategy may be adopted. For example, continuous formative assessment may be based on online evaluation and the summative assessment may be based on traditional pen-and paper examination. On the other hand, different assessment tools may be blended into the evaluation criteria like e-portfolio for continuous assessment and proctored examination for summative assessment. Tamil Virtual Academy (Erstwhile Tamil Virtual University) conducts both Online and Offline examinations for a particular programme with different weightages assigned to Online and Offline examinations (25:75).

d) **Proctored Examination:** In order to maintain the authenticity of the online examination, proctored examinations are carried out by various Open Universities and Assessment/Testing Agencies. One of the major concerns in the online examination is the issue of cheating and impersonation. This can be easily overcome by deploying AI-based proctoring monitors, Auto Proctoring and live proctoring Softwares or conducting in a controlled environment. University of South Australia (UniSA) conducts proctored online examination using Moodle quiz integrated within the LMS, in conjunction with Remote Proctoring software that will be used for online invigilation during the exam (UniSA, 2020). In India, the National Testing Agency (NTA) conducts proctored examinations for the MOOCs courses under SWAYAM initiative.

e) **Quiz/Tests:** Evaluation of learners particularly in the short-term courses offered by Open Universities (OUs) or Directorates of Distance Education (DDE) functioning under Dual Mode Universities (DMUs) mostly depend on the online evaluation techniques using online quizzes/tests. These quizzes and tests which are inbuilt in the LMS assess the knowledge of the learners through Objective type Multiple Choice Questions (MCQs). But, one of the major drawbacks of this evaluation method is the issue of learner's

Academic Honesty as such quizzes/tests are not-proctored. e-Assessment via MCQs has become an integral and increasing form of assessment, particularly with large learner bodies and growing faculty workloads at higher-education institutions (Singh and de Villiers, 2017).

Methodology

The study is based on the secondary data obtained from research publications, websites/blogs, books/book chapters, Open Educational Resources (OERs), case studies and personal interviews. The information regarding the different assessment tools used and models employed were collated and presented in the form of a flow diagram. Based on the analysis made during the study from the literatures collected, considering the strengths, weaknesses, opportunities and challenges (SWOC) of online evaluation system, and keeping in view the future trends in evaluation system appropriate for the Higher Education Institutions (HEIs); a suitable model which can cater to the needs of all the stakeholders is proposed particularly for the Open Universities (OUs) and Dual Mode Universities (DMUs) offering programmes through ODL and online modes.

The researchers based on their work experience at an OU and deeper understanding of the operations, have developed a Model suitable for the ODL system keeping in mind the large number of geographically dispersed learners and the heterogeneity of these learners who are a mix of "digital natives, digital immigrants" and even digital illiterates, who need to be converted into digital literates; imperative for survival in the times ahead.

Rationale of the Study
- To justify the need of online evaluation;
- To study the different assessment tools and models of online evaluation;
- To analyze the strengths and weaknesses of such systems; and
- To develop and propose a suitable Model for ODL institutions.

Findings and Discussions

A review of the existing practices of online evaluation has necessitated the undertaking a SWOC Analysis which will help to decide the suitable assessment tools and framework keeping in view the different stakeholders. The SWOC Analysis of online evaluation system is presented in Box 1 below:

Box 1: SWOC Analysis of Online Examination System

STRENGTHS	WEAKNESSES
- Easy to use, fast and accurate - Instant results, saves time - Less expensive, Low operational Cost - Reduction in staff workload - Possibility of on-demand examination - Students spent less time as compared to traditional method - Effective method of gathering constructive feedback	- Lack of awareness about online examination system - Limited access to computers, uninterrupted internet services and power supply - Lower learner response rates - Security concern, possibility of hacking/intrusion - Impersonation and cheating
OPPORTUNITIES	**CHALLENGES**
- Best utilized where the learners appearing are large in number - Easy integration into the current educational/examination system - Easily scalable with less cost escalation - Development and offering of innovative educational programmes in emerging areas - Emergence and integration of Artificial Intelligence (AI) technologies - Advancements in online examination system software and LMS particularly security features and proctoring. - Flexibility in scheduling the examination, less dependence on examination centres	- Ensuring anonymity and confidentiality - Learners' computer capabilities and access - Software compatibility issues (Anderson and Cain, 2005) - Poor acceptability, reputation and recognition - Motivating the faculty, learners and administrators for adopting the new technologies

Proposed Model for ODL Institutions

Though the ODL system claims to be an innovative and dynamic system but as far as its evaluation of learners is concerned, it has preferred to safely perch itself on the conventional turf by following the age old practice of

mainly evaluating its learners through conduct of pen and paper based proctored examinations (which carries 70 percent weightage in the overall assessment), for the sake of parity. Evaluation through term end examinations is an outdated method designed mainly to test the power to memorize concepts and a highly subjective method of assessment and evaluation. Evaluation strategies should be primarily focused on assessing the competency instead of the mere knowledge. This has led to popularity of the concept of Authentic Assessment in recent times. According to Mueller (2018), Authentic Assessment is "A form of assessment in which students are asked to perform real-world tasks that demonstrate meaningful application of essential knowledge and skills". Therefore, Authentic Assessments should be an integral part of the assessment and evaluation Model that is being proposed for the assessment and evaluation of distance learners.

In the Digital Age, all activities depend heavily on the use of technology. All learners irrespective of their age and status of employment are required to use digital skills in day-to-day transactions to cope with the new environment in which they are living. Therefore, digital skills or digital literacy need to be embedded within the educational activity. HEIs are also expected to develop skills of knowledge management or processing information; critical and analytical thinking skills or problem-solving skills; innovation or out of the box thinking; multimedia communication skills in their learners to be workforce ready. As Bates (2019), has very succinctly summarized the issue: "The key shift is towards greater emphasis on skills, particularly knowledge management, and less on memorizing content. We need design models for teaching and learning that lead to the development of the skills needed in a digital age". Online Collaborative Learning (OCL), experiential learning and agile design are best suited for the Digital Age (Bates, 2019, Chapter 4). OCL is the new theory / approach to online learning which is an advanced version of computer mediated communication (CMC) in which the learners are "encouraged and supported to work together to create knowledge: to invent, to explore ways to innovate, and, by so doing, to seek the conceptual knowledge needed to solve problems rather than recite what they think is the right answer.……In the OCL theory, the teacher plays a key role not as a fellow-learner, but as the link to the knowledge community, or state of the art in that discipline" (Harasim, 2017, p.90). The idea is to develop learning communities so that the learners can interact with each other. Student learning takes place through knowledge construction through the social discourse; which is guided and facilitated by the teacher. The teacher is expected to provide appropriate resources and links to resources as well as design activities for generating learner interactivity. The teacher is also expected to prepare a schedule of activities that bring participants together on a regular basis, for sharing of experiences and crowdsourcing new ideas based on their self-learning. Evaluation methods need to integrate and support these components so that learners can earn grades/ marks for their active participation in such activities. Also, all learners possess some foundational knowledge based on their experience. Therefore, assessment tools should draw upon their experiential learning. Today, the learners are exposed to new technologies, new apps so frequently, that digital literacy is simply not confined to possessing basic IT skills but the ability to adapt to the constantly changing environment through using the new technologies and applying them to solve real world problems (Bates, 2019)

The Model proposed for ODL institutions namely: OUs and DDE functioning under DMUs is a Hybrid one, with a focus on mainly online methods of assessment and evaluation. It is a hybrid model in so far as the learners will have the choice to submit their work done for formative assessment online or offline. But the summative assessment will be conducted through online examination to evaluate the learners through an automated system. ODL institutions are expected to adopt flexible approaches to facilitate their geographically dispersed learners and the convenience of taking the examination from any location convenient to them by using the internet. The advantages are many as the institution will save a lot of time; effort; and resources, both fiscal and human through the conduct of web-based online examination. The declaration of results will also be done timely and speedily without any scope of delay and also accurately and perfectly error-free results with calculation of marks and award of grades instantly and simultaneously storage and updating of results in the database.

The tools to be used for formative assessment will be designed and developed incorporating the aforementioned concept of Authentic Assessment, which will engage the learners in real learning and its application in real life situations and thereby inculcate the development of competencies and skills as per the Programme Specific Outcomes (PSOs) and Course Specific Outcomes (CSOs). The formative assessment tools will be available to the learners online which they have to access from the website just like admissions/ registration and payment of fees (as on date). But since the ODL institutions cater to the educational needs of huge number of heterogeneous learners, who may or may not have the ease of access to technology or adeptness to use it either, they will have the option of submitting their work on the formative tools of assessment either in soft form or as a hard copy to the institution. The tools of formative assessment will be more rigorous, engaging and comprehensive with the course content, focusing on the acquisition of the competencies and skills required by the learners living in the Digital Age as outlined above.

Thus, there is a proposed definite shift towards the adoption of online methods of testing and evaluation through the introduction of e-assessment tools and online examinations; a necessity today to harness technology to bring about the stated paradigm shift. Since the formative assessment will be all encompassing, innovative outcome-based and diagnostic, its weightage in the overall assessment of the learner could be in the range of 50-70 percent; and summative assessment will be 30-50 percent, depending on the nature and requirements of the programme.

A bouquet of assessment tools can be used for assessment of learners. While conceptualizing, planning and development of the programme, particularly while designing the evaluation strategy based on Learning Outcomes-based Curriculum Framework (LOCF), a teacher can choose a blend of tools from the bouquet of assessment tools depending upon the subject-requirement, type of programme and assessment (formative/summative), level of programme, suitability, availability of infrastructure/resources etc. The proposed model portraying the different assessment tools and the level of programmes in which it can be integrated are depicted below (Fig. 2):
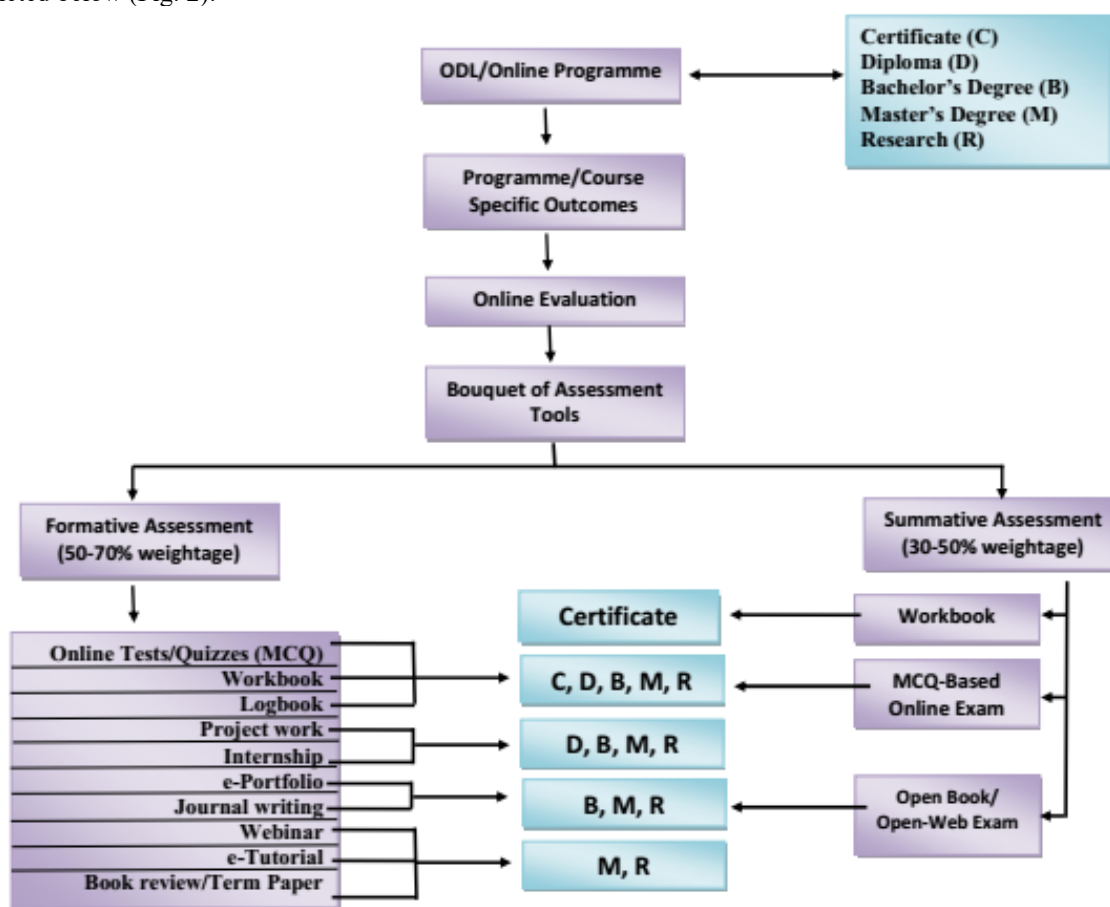

Figure 2: Online Student Evaluation Model for ODL Institutions

The marking/ grading scheme will be as per the approved methodology and notified in the programme guide available on the website. All the assessment tools will be uploaded at a designated place generally known as the Student Zone in the LMS of the institution's website. Instructions will be detailed out regarding method and date of submission, weightage in the overall assessment, turnaround time for getting the feedback, provision for re-evaluation (if any) declaration of grades/ marks, etc.

A) Tools for Formative Evaluation

Assessment tools/ instruments are directly linked to student learning and design of appropriate assessment tools lead to enhancement of student learning. Various tools which can be used for assessing the progress of the learner (continuous formative assessment) are as follows:

i)**Online Tests/Quizzes (MCQ):** This is the most commonly used method of formative assessment adopted by most of the educational institutions for assessing the progress of learners online. It is one of the best self-assessment methods which help the learner to assess his/her progress. It also helps the teacher to assess the teaching-learning process which can help in modifying the strategy. In this method, after each major section/topic, learners participate in an online Multiple Choice Question (MCQ) based self- assessment

test/quiz which gives immediate results. The process includes: a) preparation of question-banks with answer keys on every subject/topic by the teacher/instructor/expert group; b) Creating the Quizzes/Tests in the LMS using inbuilt Assessment Authoring Tool or using external quiz builder tool/software and integrating it in the LMS, c) Creating assessment schedule and informing the learners, d) Monitoring the assessment process. There are many commercial as well as open-source software/tools available which can be effectively used and integrated into the LMS. Advantages of online assessment particularly MCQ based Quizzes/Tests include automated scoring and storing of learners' responses, which can lead to enhanced efficiency, quicker turnaround time, and reduced potential for human error; and pedagogical benefits of providing immediate automated feedback (Hewson, 2007). Further, the Online Quizzes/Tests should be designed in such a way that it assesses the knowledge of learners covering various aspects like understanding of subject, problem-solving, creativity etc. with time-restriction. Cohen and Sasson (2016) envisaged that, "the design approach of online quiz/test should not be like conventional method usually used as online homework with due date, without time restriction and therefore should be designed with time and attempt restriction which motivates the learners to prepare for the quiz, cover the relevant topics, and do exercises before attempting to take the quiz".

ii) **Workbook:** A Workbook is a structured practice book prepared by the teacher that contains worksheets setting tasks, problem solving exercises and activities to be performed by the learner. A Workbook needs to be designed in such a way that it covers the curriculum presented in the Self Learning Material (SLM) covering the important concepts and developing the required competencies and skills through problem-based exercises and activities to be performed by the learners in the real life situations. This helps in developing the cognitive, affective and psychomotor skills of a learner, as they make a learner think, write and do. The purpose of the workbook is to guide independent learning; reinforce learning by ensuring that the learner interacts with the content given in the SLM and achieves the expected programme specific outcomes (PSOs) and course specific outcomes (CSOs); enable the learner to construct knowledge and reflect on the existing practices either independently or in groups by forming learning communities; encourage the learner to reflect through sharing of experiences and crowdsourcing new ideas; based on their self-learning apply the knowledge gained to solve real world problems; and also facilitate the institution to track the learner, monitor the progress made and provide feedback for further improvement.

It is a more comprehensive tool than assignments and therefore can replace assignments as a tool for formative assessment. In certificate programmes, it can also be used for both formative and summative assessment of a learner. The Workbook should be made available to the learner along with the SLM in the LMS on the institution's website. The learner would be asked to download it and after completing the worksheets given in the Workbook as per the schedule, submit it to the tutors for evaluation and feedback either through email or by submitting a hard copy. Today, there is the option of e-Workbook which contains multimedia files embedded with text, animation, images, audio and video clips in which the learner can read, listen to, watch, and interact with learning materials and record their responses online.

iii) **Logbook:** Logbook is a record which a learner maintains reflecting the activities performed during the study. It is a tool which can be effectively used particularly in subjects which require learners to perform set activities which needs to be evaluated for both knowledge and skill/competency and used for formative assessment. Tools/Softwares are available using which a learner can record the data/information on real time basis in the app or software and the same can be assessed by the teacher/instructor and feedback can be given instantly for improvement or rectification. For each course, the teacher prepares the activities to be performed by the learner in the form of a manual which contains detailed instructions on how to perform the activities and recording the parameters. Learners need to perform each and every step mentioned in the manual and record the observations/results in the logbook which may be hard/soft copy or using mobile app/software depending on the resource/infrastructure availability. Depending upon the type used, the logbook needs to be submitted periodically as per the schedule prescribed by the teacher/instructor for evaluation and feedback. Based on the activities performed and the skills exhibited by the learner, the teacher will evaluate and grade the learner's performance. In case, access to such commercial software/tools is not available in an Institution, then, the LMS may have provision for submission of logbook in the form of document online which can be assessed and feedback can be sent back to the learners.

iv) **Project Work:** Project work is an application-oriented academic activity and aims to sharpen theoretical and quantitative skills through their application in the light of theoretical knowledge gained while pursuing a programme. It is an independent investigative work. To ensure that the learners understand the content, they are given some task which involves both understanding and skill to transform the learning into outcome. What the learner has understood is more important than what they have learned. This allows opportunities for productive practice through review of existing literature/ resources. Much of formative assessment occurs through application of knowledge gained in real life situations. The Projects undertaken may be field-based study, laboratory-based experiments or analysis of some secondary data. Projects should not be stereotypic rather they should be based on real life experiences based on one's circumstances. Project work can be

assigned individually or to groups of learners. As per the guidelines of UGC issued recently, the universities may consider to assign review-based/ secondary data-based projects or software-driven projects to facilitate the learners in these unprecedented times. A Project manual could be provided to the learner which should be made user friendly. The projects assigned should be time bound.

v) **e-Portfolio:** e-Portfolio is an electronic version of a portfolio which is generally used to showcase the progress of learners' learning, achievements and indicating what a learner can do. In this, the learner's academic work like essay type answers, blogs, interviews, graphics, demonstrations etc. can be documented. A teacher can monitor and examine the learners' achievements and also evaluate effectiveness of the programme in terms of its learner outcomes. The teacher needs to assign the task to learners for preparing the e-portfolio which the learner can submit online or as a hard copy offline. The feedback can be provided to the learner in the form of tutor comments, voice recording, rubric etc.

vi) **Journal Writing:** Journal writing is basically a form of reflective writing by the learner: recording thoughts, feelings, experiences, insights and reflections on the course content provided in the SLM and sometimes even beyond the territory of the course. It is not a structured tool like a Workbook, but an important tool for formative assessment. Journaling or journal writing has the potential to ignite deeper understanding, awaken exploratory skills, develop critical thinking and improve writing skills. It is a good tool to be used for active participation of the learner in the learning process and also for developing higher order learning skills in the learner. The teacher proposing to use this tool for formative assessment should prepare a brief note on what the expectation is from the assigned task in order to provide the focus; specify the word limit and time allotted to complete the task. This tool can be submitted online or offline.

vii) **Webinar:** A webinar is a web-based seminar, particularly learner-led and teacher-directed, is an effective assessment tool to test a learner's comprehension of a subject which facilitates case-based discussions in an online format. In such an assessment process, the learners take ownership for their learning and current level of achievement relative to the standard. It provides a platform where learners can be a part of a social learning community, allowing synchronous (real-time) interactions without the limitations of physical space and geographic distance. The webinar can have other stakeholders in the discussion as pre-decided by the teacher and learners as per the need of the discussion. The role of the teacher is significant as he/she sets the parameter for good performance and discussion. Normally, the topics for discussion should be framed to allow further deliberations. Webinar makes learners responsible and accountable for their participatory approach. This enhances their self-esteem and motivates them to improvise. Webinar as a tool can be effectively used in case of professional and skill-based programmes particularly with a responsible and controlled group. The teacher makes an overall assessment of each learner based on individual performance as well as learners' reports. For this tool to be used extensively for assessment there is a need to develop a baseline survey instrument to collect demographic data of participants, prior teaching perceptions of previous online teaching experiences, comfort levels with technical and communication aspects and also to collect the post-webinar feedback.

viii) **e-Tutorials**: Tutorial is an age-old method of direct interaction between the learner and the teacher. It is an effective interface for transferring knowledge and is used as a part of the learning process. It is probably the most commonly used formative assessment tool which is applicable preferably for smaller groups. It is more interactive and specific than a classroom lecture. Tutorials are heavily example ridden which help the learners to comprehend better. e-Tutorials have replaced the tutorials conducted in face-to-face mode. Advantages of tutorial-based assessment include, evaluation based on prolonged and intense interactions between learners, peers, and teachers (tutors) to assess knowledge and competence domain, communication skills, and scientific curiosity. There should be a time table for conducting e-tutorials.

ix) **Book Review:** Book review is an effective higher order formative assessment tool. While assigning Book Review, the teacher may ask the learners to choose a book of their choice or assign a particular book to many for getting comparative reviews. The learners should evaluate what the book is about, details of the author, whether the book is path breaking in the particular area, methodology adopted by the author, appropriateness of chapterization in the Book, illustrations, the audience it targets at and most importantly the Bibliographies. Book Review should be made a mandatory tool for assessment particularly in Post Graduate and Research degree programmes as it allows the learner to apply original thinking and develops critical analytical ability. There should be a Book Review Manual for the standard operating procedure to be followed uniformly by the learners.

x) **Term Paper:** Term paper is a research paper used as a tool for formative assessment to ascertain the achievement of the expected learning outcomes by the learner required at the end of a particular course. It involves analytical and critical understanding of the course. Preparation of the term paper requires a lot of research and technical writing expertise on the part of the learner. Term papers provide an avenue to the learners to apply actively the subject matter of a course to an individual endeavour. The teacher shall be responsible for preparing the list of Term papers relevant to the course or alternatively ask the learners to

choose the topic of their interest preferably related to the course. Term Papers are evaluated using an equally weighted combination of three factors: 1) Style and Format; 2) Research Effort; 3) Analysis and Argument.

B) Tools for Summative Evaluation

The summative evaluation is done at the end of the course to assess the extent to which the learner has accomplished the objectives set in the form of learning outcomes. The assessment tools which are proposed to be used for summative assessment in the online evaluation are:

i) Online Examination: The online examination for summative assessment is the most accessible method nowadays. It is generally Computer Based Testing (CBT) and Optical Mark Recognition (OMR) based question types. Generally, objective-type questions like Multiple-Choice Questions (MCQs); True or False; Fill in the blanks; and short answer questions are preferred and therefore the assessment is fully automated, reliable and accurate. The HEI can organize the summative online examination through its own Learning Management System or using open-source/third-party software integrated into the LMS. The process includes: creation of an account; development of Question Bank with answer keys by subject experts covering the entire course; creating assessment schedule and sharing of the link with the learners on the day of examination. To avoid any malpractice, two examination delivery solutions are used *viz*. Digital Evaluation Platform and Just-in-Time Question Paper (JIT-QP) wherein encrypted question papers are delivered just before the examination. These solutions are very helpful to ensure secure examination delivery and evaluation.

Learners can take these exams anywhere using any device like Desktop/laptop, tablet, mobile phone etc. with uninterrupted internet connectivity by just clicking on the shared link. Then s/he has to enter her/his enrolment details and attempt the exam. Each learner can be provided with a specific set of questions drawn from the question bank randomly and thereby minimize the probability of copying and leakage of questions. Since, the answer key is already fed in the system, the responses are auto-evaluated immediately and the learner can get the results/feedback on her/his performance by the click of the button. Further, softwares are also available for calculating the score according to weightage, preparing a rank list and also generating the e-grade cards. The main advantage of this system is that it can be operational with very few resources and easy to access. It also reduces the expenditure on conducting examinations as there is no requirement of printed question papers, answer scripts, examination halls, invigilators, examiners, evaluators etc.

ii) Open Book/Open-Web Examination: Open Book Examination (OBE) is an exam where the learners are allowed to use and refer to certain resources like the Self-Learning Materials, Books, Notes etc. In Open-web examination, the learners can access the learning resources available on the internet. They are broadly of two types: 1) restricted-approved list of resources and 2) unrestricted-any material that may support the examinee. Both the types of OBE have one thing in common i.e, the OBE makes it obligatory for a learner to have a sound understanding of the syllabus, content and concept of the course. Mapping concepts or theories, charts, diagrams, equations, data in mind is pre-requisite and advisable so that while attempting the OBE, the examinee can systematically put up the thoughts quickly avoiding the time constraint which may occur in searching for the answer from the resources. Unlike closed book examination, where it is a common practice by the examinee that they memorize the answer, the OBE demands three types of skills i.e. synthesization, analyzation, and application of the concepts and thoughts. For conducting a successful open book or open-web examination, proper training and planning to and by the examinee and examiner is highly required. A mock test prior to conduct of the examination will be a good idea as this will give an opportunity to both examinee and examiner to understand the expectations from each other. "Open-book, open-web online examinations reduce test anxiety, enhance learning and make the students to be more aware of their studying and learning strategies and supported professional-like performance" (Myyry and Joutsenvirta, 2015).

OBE can be conducted in two ways either sitting in a specified closed room with or without the online tools and another way is to plan an OBE as take-home exam.

It is not that the open book exam will change only the evaluation method, if implemented, it will surely impact both the learning and teaching strategies. Questions have to be designed which can evaluate the problem-solving skills, creativity, and in-depth knowledge of the concept.

Quality Assurance

Quality Assurance is the process of maintaining the desired level of quality devoid of errors/issues in the services provided by following the standard operating procedures at every stage of the process. Effectiveness of online exams can be achieved by designing them to be valid, reliable, secure and flexible, with the purpose of promoting learning and ensuring alignment with LOs (Shraim, 2019). The two major concerns pondering around the Online Evaluation System are the Quality and Accountability. Though, these two are essential even in the traditional evaluation system, they are mostly insisted upon only in Online Evaluation. These two factors can be easily tackled if the Institutions put in place a dedicated Online Evaluation Cell under the Evaluation Department. The Cell should be strengthened with the adequate staff ranging from academic (software

professionals, Teachers/academicians, technocrats etc.) and administrative (Deputy/Assistant Registrar) and support staff (data entry operators, Multi-tasking staff etc.). Adequate state-of-art infrastructure, resources (like computers, software, internet, servers, power-back up etc.) and financial support should also be ensured for smooth functioning of the cell. Periodic evaluation, feedback from stakeholders and review can lead to accountability and improved quality. Periodic capacity building activities and training of all stakeholders involved in conduct of online examination is a must for improving the quality. Learner support and grievance redressal systems should be available round-the-clock for swift resolution of queries. Tight security and restricted access should be strictly adhered to.

Cyber security, hacking of sensitive data and websites, and leakage of virtual private networks are the biggest challenges for online evaluation. Universities have to be ready with "Plan B" to tackle any type of emergencies while conducting online evaluation. Many times, situations arise that due to technical glitch, examination gets interrupted in between or even does not go online. Such situations and many others are very common while conducting exams. A pool of question banks will serve best in such types of situations.

Conclusion and Suggestions

The shift to online teaching, learning and evaluation leads to the design and development of new models that are based on the new technologies. In this paper, the researchers have outlined a new Model for Student Evaluation, based on a SWOC analysis of the existing models of online evaluation and available online assessment tools; suitable for learners enrolled in ODL institutions. The proposed Model addresses the changing skill requirements for the Digital Age and also offers a solution to the teachers working at ODL institutions grappling with the challenges posed by COVID-19 to integrate and adopt online methods in their teaching, learning and evaluation systems. The expectations from the OUs at this juncture is to pave the way for adopting technology-based evaluation methods both formative and summative and to unshackle the rigidity of conducting only pen and paper-based examination. The HEIs should mould themselves to cater to the needs and aspirations of the 21st century learners and give more weightage to formative assessment in order to develop skills and competencies required of a knowledge society rather than promote rote learning.

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