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Re-imagining Assessment in the AI Driven Education

Dr. Rashmi Singh
Assistant Professor, Department of Education, S. S. Khanna Girls' Degree College, University of Allahabad
Email:-rashmisingh23.lucknow@gmail.com

Abstract:

Teaching has no meaning until it has not culminated in the learning of the students. And learning of the students have been observed and measured by their assessment mainly. Measurement, assessment and evaluation are generally used interchangeably in the educational landscape but these terms have marked difference in their connotation and coverage. Measurement is students' achievement in the quantitative terms only i.e. mainly scholastic achievement, while assessment is gathering of all the data related to students' performance whether quantitative (scholastic) or qualitative (co-scholastic), i.e. it has broader coverage and evaluation is putting value to the student's performance on the basis of assessment, i.e., whether students are able to get grade 'A' or pass that examination or not. As the system of education has evolved progressively over time, the concept of assessment too has evolved in the same manner. Assessment now has many meanings like assessment of learning (summative- evaluation of student's performance at the end of the instructional period to decide whether they are pass or not), assessment for learning (formative- an ongoing process conducted during instruction, mainly for improvement of student's learning) and assessment as learning (here students are actively involved in their own learning process by using assessment). After the inclusion of technology in education, the concept of teaching, learning and assessment has been revolutionized in a way that no one has imagined before this era. Now is the era of artificial intelligence, every dimension of life has been colored in artificially intelligent way and hence the educational assessment. This article will deal with the concept of traditional

educational assessment, its shortcomings, and the changed assessment practices in the age of artificial intelligence, their benefits as well as challenges in implementation.

Key words- assessment, formative, summative, technology and artificial intelligence

Introduction: From time immemorial, assessment is an integral part of teaching-learning. Assessment has many forms and has evolved its functions from time to time, as discussed earlier like summative, formative and 'assessment as learning'. Summative assessment is traditional type of assessment which has occurred at the end of semester, year or instructional unit and the result of this assessment has a decisive part to declare student as pass or fail. It has no role in helping the students to improve their learning. However formative assessment is a newer form of assessment which has evolved after the inclusion of the concept of CCE (continuous and comprehensive evaluation). Formative assessment considers assessment as an ongoing process which has diagnostic function, i.e. to diagnose the learning difficulties of students and then modify the instructional strategies for the same in order to meet the students' needs and difficulty levels. It also helps in the formation of curriculum in alignment with the students' needs and interest too, hence termed as formative assessment. And the latest concept of assessment in this series is, "assessment as learning". The concept of pedagogy (to lead the child) has also evolved to andragogy (leading men or leading adults) and then to heutagogy (self-determined learning) where learner is self motivated to learn. Same is the case with assessment as learning; here teacher encourages students to take responsibility for their own learning in the form of peer assessment, self assessment and self-reflection. Hence assessment as a practice has come a long way and is still progressing and evolving in the technology-laden education system.

Traditional Assessment Practices: Traditional assessment practices have been termed as SAP (Standardized Assessment Paradigm). This paradigm has underlying philosophy that one size fits all approach, means there can be predefined skill sets and objectives and items in the question paper which will be best suited for all the learners' whatever their inherent diversities will be. In this system, there was no space for personalization and scope of individual differences among learners. There was no acceptance of the concept of multiple intelligences, as only academically brilliant student has been considered as intelligent. There was no place for inclusion of various dimensions of intelligence like naturalistic intelligence, spatial intelligence interpersonal and intrapersonal intelligence and so on. Hence the assessment pattern has covered the scholastic dimensions only. One more thing this sort of assessment paradigm has no

scope for feedback too. Now, we are aware about the concept and importance of immediate feedback (Skinner's Operant Conditioning) in student's performance and in shaping their desirable and measurable behavioral outcome. But we know that in traditional system of assessment either we do not give feedback or it has been too late, which is good for nothing. Shortcomings of traditional assessment practices can be grouped as:

1. **Subjectivity and bias-** Traditional assessment paradigm is based heavily on essay type test which are inherently affected by subjectivity bias. There is no rubric sort of pattern to examine essay type test resulted in heavy subjectivity and bias (implicit as well as cultural) on the part of examiner.

2. Focus on rote learning- Traditional assessment paradigm focuses mainly on rote learning of the students. It often include a high proportion of questions that require students to recall facts, formulas or procedures without understanding their real-life application. It rarely asks questions based on application level. These assessments may reward formulaic answers rather than encouraging students to think creatively or critically about complex problems. Hence these sort of assessment are not at all reliable because they do not test the actual learning of the students.

3. Lack of transparency- Traditional assessment paradigm lacks transparency because here student's learning outcome and expectations are unclear. Because traditional assessments often rely on vague or undefined criteria, leaving students uncertain about what is expected of them. Without transparent rubrics, grading can be perceived as arbitrary or biased, leading to distrust in the assessment process.

4. Overemphasis on LOTS (Lower Order Thinking Skills)- Traditional assessment paradigm has overemphasis on lower order thinking skills. In traditional system there is no scope or consideration of Bloom's Taxonomy (hierarchy of cognitive level- understanding, remembering, applying, analyzing, evaluating and creating) in which upper three, analyzing, evaluating and creating are higher order thinking skills and lower three, understanding, remembering and applying are lower order thinking skills. It means rarely our traditional examination system has any sort of emphasis on analysis, synthesis and creation aspect of cognition.

5. Standardized testing- Traditional system of education has followed the concept of standardized testing means one size fits all approach which is in opposition itself to the concept of personalized or adaptive testing. It has the philosophy of predetermined skill sets and learning objectives for all the students alike, which we know that can not suffice the purpose for all the students.

Integration of technology and changing context of assessment: When technology has permeated in our lives, it has changed, modified and revolutionized every dimension of our life and the educational system. We are now familiar with and offering synchronous (Google meet, Zoom, Microsoft teams) as well as asynchronous mode (you-tube based pedagogy) of instruction. Classrooms have been changed into LMSs (Learning Management Systems). lectures have been converted into modules and classes into online courses. In this article we will focus on the changed pattern of assessment only. So if we talk about changed role of assessment in the light of integration of technology in educational scenario. It can be categorized into two heads:

- **From Standardized Testing to CBT (Computer Based Testing)-** After the integration of technology in the form of computers and internet, the traditional assessment paradigm (SAP) has been transformed from standardized testing (one size fits all approach) to CBT (Computer Based Testing). In CBT, one feature which is most advanced than standardized testing is inclusion of immediate feedback and increased access to the students. In addition to this, it has several other benefits such as efficient grading and reporting and flexibility to complete.
- **From CBT to AI (Artificial intelligence) based assessment-** We are not going into the detail of conceptualization of AI. In this article we are taking AI, into its most basic form like, "The development of computer systems that can perform tasks that would typically require human intelligence, such as learning, problem-solving, decision making, and perception." It is a matter of common knowledge now that AI has dimensions like deep learning, machine learning, natural language processing (NLP) etc to make its task faster, better and more efficient. When AI has touched our lives it has changed our education system too. AI based assessment system has many advanced features than Computer Based Testing (CBT), like improved efficiency, enhanced accuracy, personalized assessment, real-time feedback and greater scalability and accessibility.

AI driven assessment practices: AI driven assessment practices have an upper edge in terms of adaptability, accessibility, inclusivity, scalability, and personalization. These practices have been termed as:

- **Holistic-** Holistic means covering all the competencies of students like wide range of skills and competencies, including critical thinking, creativity, problem-solving, and collaboration, which a traditional as well as computer based testing cannot assess. These assessment s go beyond traditional metrics in terms of accuracy and speed.

They may incorporate feedback from peers, mentors, ad self-assessments to offer a well-rounded evaluation.

- **Equitable-** Equitable means in alignment with the diverse needs of the students so that assessment pattern does not suit the needs of only few students. It must perceive equally by all the students irrespective of their interests, needs, and learning styles. AI-driven assessment tools eliminate human bias by focusing solely on the content and correctness of a student's response, ensuring a neutral evaluation.
- **Adaptive/ Personalized-** AI based assessment has actually made assessment system adaptive or you can say personalized in actual sense. Adaptive testing means testing of individual in terms of his/her difficulty level of questions based on a student's performance in real-time, creating a personalized assessment experience that reduces text anxiety. These tests can be tailored to individual students' needs, providing a more accurate measure of their skills and knowledge. As theory says that these tests can alter or you can say adapt themselves in accordance to students' performance in real time and suit to the students' knowledge level.
- **Curriculum-embedded-** Curriculum embedded assessment is an innovative approach that integrates assessment into the curriculum, providing a more comprehensive and authentic measure of student learning. These assessments are designed to be a integral part of the instructional process, providing teachers with valuable insights into student learning and understanding. The primary purpose of curriculum embedded assessments is to improve student learning , rather than just measuring student achievement.
- **Data-driven-** It is a form of AI-based assessment that utilizes machine learning algorithms and natural language processing to evaluate student performance. Due to this advancement these assessments are more personalized, can provide immediate and personalized, real time feedback with improved accuracy and enhanced efficiency.

Benefits: AI based assessment use ITS (Intelligent Tutoring System) to provide personalized and real feedback to the students. It is now clearly evident that AI based assessment practices are in sync with the psychological and philosophical principles of assessment and also aligned with the needs and interests of digital learners too. These benefits can be grouped under subheadings like:

- **Automated grading-** Unlike traditional assessment practices, AI based assessment paradigm has in build feature of automated grading. It has minimized subjectivity,

bias and error on the part of examiner and decrease the workload of teacher to make him free for other tasks.

- **Personalized and real time feedback-** The most important benefit of AI driven assessment practices are their ability to provide personalized feedback to the students means in accordance to their performance personally that too in real time means in no time after their submission of assignments or projects. This is a miracle which can never be possible manually.
- **More effective and highly engaged-** Because assessments are suited to student's personal needs, and intelligence level, they found it most effective and remain highly engaged through out the assessment unlike the traditional system where they found assessment pattern tough, boring and stressful.
- **Learning pathway recommendations-** On the basis of ITS and NLP dimensions of AI, these assessment practices can have the predictive power in themselves and can recommend learning pathway for students on personal basis. This is a revolutionary step under assessment practices.

Challenges: In spite of so many benefits over traditional assessment practices and even over computer based testing. There are many challenges inherent in AI based assessment practices too. They can be discussed as

- **Algorithmic bias-** Because AI is based and trained on data set, so if there is any bias or skewed nature lies in the data, it reflects in the decision making too and termed as algorithmic bias. So it can be said that Algorithmic bias refers to the unfair or discriminatory outcomes that can arise for the use of AI algorithms in decision making processes, including assessment and evaluation. If the training data is biased, the AI algorithm will learn and perpetuate these biases.
- **Ethical considerations-** Ethical considerations are a crucial challenge in the use of AI-based assessment practices. As we have already discussed about algorithmic bias, this eventually lead into ethical considerations because AI algorithms can perpetuate existing biases, leading to unfair outcomes for certain student groups. Certain questions may also arise that who is accountable for the decisions made by AI systems which are found unethical.
- **Privacy and safety concerns-** Privacy and safety concerns are another significant challenges in AI based assessment practices for all students in general and for female students in particular. AI based assessments often require extensive data collection, including sensitive student information, which raises concerns about data protection and privacy. AI models can be vulnerable to data breaches, potentially exposing

sensitive information. AI systems can be susceptible to hacking and other security threats, compromising student data and assessment integrity.

Conclusion: No doubt assessment is integral part of teaching and learning and it has changed many forms since its inception. It has changed in accordance to the need of time. Technology has made assessment more engaging and fruitful. But AI driven assessments has altogether revolutionized the assessment practices in terms of improved efficiency, accessibility, inclusivity, personalization, adaptation, holistic approach and equitable assessment. But these benefits have attained at the cost of unethical considerations, and privacy and safety concerns on the part of students. Hence we must use AI with implementing best security practices, and principles so that transparency and consent can be provided to get its utmost benefit.

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