

# Revolutionizing Assessment: Real Time Artificial Intelligence Driven Personalized Feedback- Scopes, Challenges and Best Practices

<sup>1</sup>Ananya Pramanik, <sup>2</sup>Dr. Alka Rani

<sup>1,2</sup>Faculty of Education, Banaras Hindu University

*Abstract- Assessment is an integral part of Education since its origin. Without proper assessment procedure the education process remains incomplete. With the advancement of technology the assessment procedure kept changing rapidly with its specialized tools and techniques. Artificial Intelligence in recent time has brought revolution in the educational spectrum. The personalized and real-time feedback it provides changed the strenuous process of traditional assessment procedure worldwide. To explore the contribution of Artificial Intelligence in the assessment appraisal the researchers employed content based analysis of relevant secondary sources of data collected from research paper, e-contents, e-books and websites etc. This finding of the paper clearly showed how Artificial Intelligence has reconstructed the course of assessment along with its existing practices, challenges and best possible scopes in future. The code extracted from the relevant documents eventually showed how Artificial Intelligence can be incorporated in order to reconstruct the assessment and evaluation mechanism of students irrespective of their levels and knowledge.*

*Index Terms Artificial Intelligence, Formative assessment, Intelligent Assessment tools, Real-time personalized feedback*

## I. INTRODUCTION

The assessment and Evaluation are inherent functioning components that are prevalent in educational practices globally. It's only through a structured evaluation; a child as well as teacher can perceive the accurate learning outcome against any educational objective. Traditional assessment includes standardized, subjective and objective based tests that are recognized as authentic form of assessment recognized by all the stakeholders of Education. With the advancement of Technology there have been moderate changes in the assessment domain. The online and ICT based tools have been used by teachers since a long time to reduce the burden of workload from them. Mostly, the objective and standardized form of assessments were evaluated as form of eligibility and aptitude tests as the

technology mediated tests are mainly in concise and multiple choice based format. With the arrival of Artificial Intelligence the evolution and assessment criteria witnessed a paradigm shift as it is efficient enough to support any individual with real time individualized feedback reconstructing the milieu of assessment and evaluation mechanism. Experts predicted the ways AI might transform the evaluation i.e., faster personalised feedback, increased differentiation in assessment, predictive analytics, less grading and more assessment and empowering students to own the assessment process [1]. Research studies explored how AI-led assessment and feedback practices can enhance the student's learning outcome designing a data driven, valid, reliable and constructive approach [2]. There are research studies to fulfil the purpose of employing generative Artificial Intelligence in educational assessment and its possible challenges, scopes and opportunities [3]. Artificial Intelligence has turned assessment procedure to individualized guided instruction, making teaching-learning adaptive and highly personalized. Experts recommend using Artificial Intelligence in providing alternative form like audio-video, graphic feedback in the form of mind mapping which can bring clarity in student's concept building and this form can be largely supported by Artificial Intelligence with its high logistics support [4]. The constant feedback it delivers to students, helps building their intrinsic motivation to set life-long learning goals [5]. The large data algorithm model it provides helps educational institution to divide students in clustered way according to their learning achievements. [6] Researchers have built an artificial Intelligence based assessment scale to ethically integrate generative Artificial Intelligence in educational assessment. This practical and flexible approach of assessment might reduce the uncertainty and anxiety regarding Generative AI in current education scenario among the stakeholders [7]. AI-infused assessment system can be handful tools for

teachers to track and monitor student’s progress on regular interval basis to get a formative based feedback by automated grading, offering tailored instruction for student based on their needs. On the other hand students who are engaged in scholarly work get an instant feedback in academic writing on different disciplines supported by the large augmented data sources of Artificial Intelligence [8]. There is no single assessment type rather focusing on multiple assessment approach is increasingly necessitated by Generative AI [9]. Artificial intelligence is reported to be capable of analysing data from wearable devices such as assistive devices and biometric sensors to monitor student’s behaviour modalities and identify patterns to detect student’s difficulties which can be significantly effective for students with special need [10]. Researchers in this study thus tried to explore the exponential growth of Artificial Intelligence in assessment and discussed the best practices along with its potential threats in educational context.

## II. RESEARCH QUESTIONS

Mainly three research questions were addressed in this study-

- How the Artificial Intelligence transform the traditional assessment practices?
- Which futuristic scopes are based on Artificial Intelligence based assessment mechanism?
- What are the possible challenges of AI-driven assessment procedure for both student and teachers?

## III. METHODOLOGY

A content analysis was organised in order to analyse the data extracted from the various secondary sources of data collected in the form of research papers, articles, blogs, websites to examine the key functions of AI-based assessments along with its scope and futuristic scopes. The key findings were presented through tables and figures with necessary description and elaboration.

Table 1.1: AI integration in all forms of Assessments

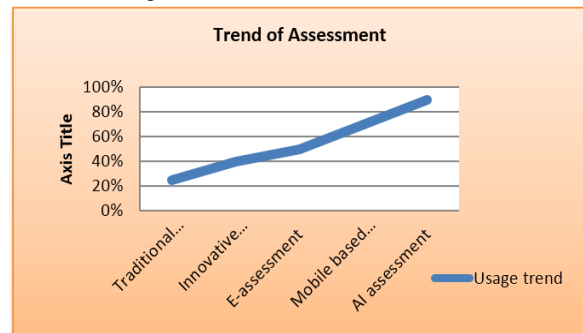
Assessment types	Scope of AI integration	AI-powered platforms & tools
Formative Assessment	Automated generated quizzes and educational games Real time feedback Curated feedback based on student’s difficulty adjustment	Kahoot!, Quizlet, Quizalize, Edulastic, GoFormative, Socrative
Summative Assessment	Essay scoring & feedback	ETS e-Rater

## IV. RESULT

The researchers in the research study elaborated the findings according to the research questions generated to meet the primary objective of the study. The details of the finding were explicated by the researchers with tables and figures.

To answer the first research question it is important to know that all the Traditional form of assessment we know generally comprises of formative, summative, peer-based and structured evaluation which have sketched the outlines of academic achievement of students so far. The standardized form of assessment has been used to get authentic student record regarding their learning outcome. In the last decade the situation has been drastically changing with integration of technology in assessment and providing feedback for students. The inculcation of Computer based assessment in proctored environment, E-assessment in the form of quiz, MCQs and short type answers, Mobile platform based feedbacks etc. Artificial Intelligence is the newest and probably the most diversified source for algorithm based assessment. The trend has been showed through a line graph by the researchers.

Fig 1: The trend of Assessment



The researchers have analysed how AI can transform the assessment in multiple ways. The possible ways of AI integration are presented in tabular format with mentioning of the particular AI-instructed platforms and tools that are already in use. While analysing the data the researchers include the answers to second research questions which is to find the scopes of AI integration in assessment areas for future perspectives

	AI-based question generation Language assessment	Vantage Learning Gradescope Edmentum Respondus Proctoria LOFT [11]
Diagnostic Assessments	Personalized learning recommendation Providing Adaptive assessment for students with special needs AI- driven predictive analytics	Magoosh’s Diagnostic Test Kaplan’s Adaptive Learning Princeton Review’s Adaptive Learning ETS IBM Watson Education’s Diagnostic’s assessment
Innovative Assessments	AI-based project based assessment AI lead portfolio evaluation	Blackboard learn Top Hat Edmentum Trello Peermark
Inclusivity in Assessment	AI powered text-to-speech and speech-to-text systems Multilingual support and translation Personalized lesson plans	Adaptemy Text to Speech Software: ClaroRead, Natural Reader Speech to Text software: Dragon, Apple Dictation AI chatbots Cogmed Blackboard Ally
Teacher Support & Grading	AI- assisted grading & feedback Automated AI based rubric development ad scoring AI supported lesson planning & curriculum design AI-driven test questions and items	TeachEasy TimelyGrader ZIPGRADE Cograder Canvas Smodin MagicSchool Eduaide.Ai Feedback studio EnlightenAI Graded.Pro
Other Emerging Assessment	Student sentiment analysis and feedback AI supported chat bots Customizable AI input in educational research	Grammarly Writing feedback Qualtrics MonkeyLearn Semantria Gemini ChatBots Claude

The researchers here accommodated the AI-powered assessment tools which are tested and used by worldwide teachers and students. With the rise of generative AI tools the traditional evaluation tools have witnessed a paradigm shift.

While answering the third research question the researchers needed to consider particularly in which aspect Artificial Intelligent tools can be malefic in student’s assessment. Artificial Intelligence with its large data algorithm support can bring privacy concern for both the user and test administrator.

Biasness is integral for opting AI based assessment in classroom and academic discourse. To develop the situation experts have suggested to reconsider the designing of AI-led assessment which encourages balance use and giving scopes to demonstrate individual human knowledge integrated within the assessment structure [11]. There are numerous scopes where AI can misguide the stakeholders with all potential biases. The researchers tried to accumulate the dominant challenges that are associated with the usage of AI in assessment spectrum.

Table 1.2. Challenges in Assessment associated with Artificial Intelligence

Challenges in Assessment associated with Artificial Intelligence	Possible Suggestive Measures
Technical Challenges: i.Data Quality and integrity i.Flaws in algorithm structure i.Data Irrelevancy	To mitigate technological challenges : i.To prepare AI to use diverse and large representation of data to reduce the biasness. i.Tightening Cyber security

<ul style="list-style-type: none"> <li>v.Lack of Reliability and authenticity in generating grading of students</li> </ul>	<ul style="list-style-type: none"> <li>i.Using large cloud based infrastructure</li> </ul>
<ul style="list-style-type: none"> <li>Challenges in ensuring data integrity with ethics and fairness</li> <li>i.Lack of Content Validity</li> <li>i.Scope of human bias in AI's decision making judgment</li> <li>i.Vulnerability of student's data</li> <li>v.Data Piracy</li> </ul>	<ul style="list-style-type: none"> <li>There are certain measures to remove the challenges:                             <ul style="list-style-type: none"> <li>i.Design the AI assessment with collaborating subject matter expert so that the content remain authentic</li> <li>i.Properly correlate the AI-based and real world assessment outcomes.</li> <li>i.Use diverse and representative human evaluation panels</li> <li>v.Integrating detailed score reports, explanation of AI decision making</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>Pedagogical Challenges in AI-proctored assessment</li> <li>i.Misalignment of AI-assessment outcomes with learning objective</li> <li>i.Lack of authenticity in scoring and grading student's tasks</li> <li>i.Lack of professional skills from teachers to integrate AI in assessment procedure</li> <li>v.Students' stress and anxiety to appear in AI based assessment</li> <li>v.Incompetency in guiding discussion and collaboration due to the lack of rational thinking [12]</li> </ul>	<ul style="list-style-type: none"> <li>To eradicate the pedagogical issues:                             <ul style="list-style-type: none"> <li>i.Cooperating with educators to use learning analytics and take the guidance to combine AI-based assessment with curriculum design</li> <li>i.Using real-world scenario, project assessment and competency based evaluation in AI-powered assessment. Asking students for referencing from texts rather copying from internet. [13]</li> <li>i.Providing teachers awareness and training about the assessment tools and techniques</li> <li>v.Using adaptive difficulty adjustment to cope up student's anxiety and stress in appearing assessment.</li> <li>v.Using AI as supportive tool facilitated by teachers</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>Challenges regarding implementation of AI based assessment</li> <li>i.Lack of cost and resource allocation for adapting AI in assessment mechanism</li> <li>i.Infrastructure shortfall to implement AI-based assessment</li> <li>i.Insufficiency of teaching professional who are skilled in usage of AI</li> <li>v.Failure to maintain between Human and AI-based evaluation</li> </ul>	<ul style="list-style-type: none"> <li>To address the infrastructural challenges:                             <ul style="list-style-type: none"> <li>i.Proper funding and resource allocation should be explored and funding opportunities should be analysed</li> <li>i.Build infrastructural constituent to support the AI assessment mechanism in educational context</li> <li>i.Bridging the gap between the skill and knowledge of AI integration</li> <li>v.SWOT analysis for assessing the infrastructural gap to address the administration and policy stakeholder</li> <li>v.Creating a symbiotic environment of AI integration with human skill and diction.</li> </ul> </li> </ul>

The challenges and the tentative solutions provided by the researchers had justified the research question along with structural solution. The researchers had extracted some key findings while discussing the result section which was presented through a proper word-cloud focusing on the major ones that had been presented with graphic illustration.

#### V. SUGGESTION & RECOMMENDATION

Artificial Intelligence can help in the quest for alternative assessment where without replacing the face-to-face feedback can provide accessibility for student to receive feedback overcoming barriers, thus supports the life-long learning for students. Experts have recommended recommendation on how AI should be incorporated while designing assessment tasks which includes highly personalized and contextualized experience to promote embedded and continuous assessment. [8] While designing AI- based assessment it is highly required to re-establish critical thinking, stressing on in-class assessment and more project oriented learning where students need to be involved in a

group where students can collaborate without being over-dependant on AI-generated educational content.[14]. All the educators, policymakers and other stakeholders must work together to minimize the risks of AI-powered assessment to enhance students learning outcome. The constructive outlook for designing and implementing such tools must be ensured to get the desired result [15].After analysing the available sources researchers had suggested to assimilate all the pedagogical components into designing AI-powered assessment to make it more reliable, well-constructed and trustworthy for both students and teachers while providing easy accessibility to use those platforms and tools. The stakeholders should be more prepared to embrace the innovative form of evaluation for betterment of future learners. The researchers kept the scope for readers and other researchers to do empirical study to investigate the impact and effectiveness of AI tools in student's learning outcomes.

## VI. CONCLUSION

This research was entirely dedicated to scrutinize the scope and the confrontation Artificial Intelligence can possibly have in amalgamating with our traditional educational model. This era is bringing modification in Educational regime with utmost technological advancement especially Artificial Intelligence that is able to imitate human cognitive thinking poses greater impact as well as challenges for teachers and students in coming ages. It brings profound changes that transcend the prevalent limitation of evaluation. Therefore, inculcating this superbly evolved technology slowly into system stakeholders can avoid further complexity in educational field. Assessment and Evaluation being an functional unit of learning must need to be merged with AI-powered solution for upcoming generation.

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