

Innovative Approaches to Inclusive Curriculum Design in University-Level Special Education Programs

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ABSTRACT:

This paper tackles the issue of the perennial disjointed curriculum design that cannot support the needs of learners with special needs in higher education special education programs. The goal is to create and test an adaptive curriculum model that merges Universal Design of Learning (UDL) with assistive technologies and personalized learning based on data. The design-based research, quasi-experimental evaluation, and learning analytics were utilized in a mixed-method approach that dealt with numerous cohorts. The model suggested included AI-enhanced content adaptation, multimodal tests, and inclusive pedagogies. The findings show that the access to learning (62 vs.

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88, +41.9), student engagement (55 vs. 84, +30.9), and learning results (68 vs. 89, +30.9) improved significantly. As compared to traditional curricula, there is improved retention (+27.4), less dropout (-33.2), and increased satisfaction (+46.8). The framework was significantly better than baseline UDL-only implementations, 18-23 percent in key metrics of performance. The parameters of this paper are scalable curriculum design principles, policy implications and integration pathways of digital learning ecosystems in universities. The results are evidence-based practices of inclusive education and contribute to the institutional change towards the equitable learning environments. The research finds that adaptive curriculum models that are strategically integrated can greatly improve inclusiveness, academic achievement, and experience of students in higher education special education programs. Future research ought to consider cross-cultural validation, longitudinal effects and how they can be combined with new technologies like immersive learning and smart tutoring systems to enhance the effectiveness and sustainability of inclusive curricula in higher education settings worldwide so that there is continuous improvement and fairness.

Keywords: Inclusive Curriculum, Special Education, Universal Design for Learning, Assistive Technologies, AI in Education, Higher Education Inclusivity.

I. Introduction

University-based special education programs have been grappling with curricula that are poorly formed to respond to the needs of learners with various cognitive, physical, and sensory needs. The conventional models of pedagogy that were mainly developed in the context of normative learners marginalize students with disabilities in a systematic way by delivering the content systematically, using inaccessible forms of assessment, and not incorporating technology extensively (Mansur et al, 2023). The worldwide move towards inclusive education, based on the principles of the United Nations Convention on the Rights of Persons with Disabilities and legislative requirements of countries, requires higher education institutions to reconsider the principles of foundational curriculum design. Universities are in a unique position to spearhead this change but based on empirical evidence, it appears that many institutions still cling on to the old methods of instruction which

still pose a real impediment to equal participation. The rise in the heterogeneity of the student population, with the consequent rise in enrolment of students with learning disabilities, autism spectrum disorder and sensory impairments, requires an immediate pedagogical innovation (Bornman et al., 2025). Devoid of institutional curricular reorganization, the institutions will perpetuate academic inequity and may end up not executing their mandate as agents of social inclusion and professional preparation.

Although more and more scholarly interest is given to the notion of inclusive education, there is still a research gap in the area of adaptive technology adoption, curriculum personalization based on the data, and the overall application of UDL in the realm of special education in universities (Carrillo-Sierra et al., 2025). The available literature mainly focuses on inclusive curriculum either in the policy approach or the isolated pedagogical interventions, without covering the holistic frameworks that will

cover both content access, the flexibility of instruction, equity in assessment and real-time feedback systems. Moreover, the application of artificial intelligence in the dynamically adapted learning content to a specific profile of the learner has not yet been well-researched in the area of higher education special education. Existing applications of UDL, though useful, are not as precise as learning analytics and AI-based personalization, which means that the accommodations are made in general ways and, therefore, do not address the unique needs of specific learners. In this study, the lack of an evidence-based, technology-integrated, multi-layer curriculum architecture is the main research gap that inspires this study (Diaz-Vega et al., 2020).

This research has four main goals: (1) to develop an all-inclusive curriculum framework that incorporates the principles of UDL, adaptive learning based on AI, and assistive technology tools; (2) to test empirically the effectiveness of the proposed framework by assessing the accessibility and engagement of learning, student retention, and academic performance; (3) to compare the proposed model with the conventional curricula and place the UDL-only implement The main contributions of the research are the introduction of a new multi-layer curriculum design, AI-based content personalization engine, which was tested on a variety of student groups, a multi-faceted assessment system with mixed methods, and the guidelines on the practical implementation of the research in the special education administrator and curriculum developer of the university. These contributions not only develop the theoretical base of inclusive higher education, but also present practical evidence on how institutions can be changed.

The importance of coming up with strong inclusive curriculum frameworks goes beyond the performance of individual students. At the institutional level, fair curriculum design diminishes the rate of attritions, the performance of the graduates and institutional accreditation levels. Socially, special education professionals with first-hand experience of inclusive pedagogy who are trained to advocate and apply inclusive practices are

in a better position to promote and enforce inclusive practices at K-12 and post-secondary levels (Kenny et al, 2023). Moreover, incorporation of assistive technologies and AI-based personalization in university programs creates the technological competency level between the teachers, which will equip them with the ability to implement these technologies efficiently in their respective professional careers. The framework outlined in this paper therefore has two-fold purposes: not only does it enhance the learning experience of students with disabilities in universities but it develops a generation of teachers who are well-equipped with the abilities and sensitivities required to be champions of inclusive practices in educational practices.

II. Literature Review

A chronicle of curriculum design in special education shows a slow yet bumpy shift of models of segregated, deficit models to models of inclusive, strength-based models. Conventional model of the curriculum used was mainly based on standardized content delivery, standardized assessment and fixed pacing that posed systemic disadvantages to the learners with different needs (Subhashini et al., 2026). The development of differentiated instruction as a pedagogical model was an important conceptual development, which proposed the idea of unique learning experience, which is responsive to the readiness, interests, and learning profiles of individual students. Universal Design for learning later offered a more proactive, systematic and prescriptive strategy, recommending the intentional infusion of various means of representation, action and expression, and engagement throughout curriculum structure (Samaniego et al., 2025). The proactive philosophy of UDL, which addresses diversity in learners beforehand, instead of adapting the educational environment, has ample empirical evidence, with research recording better engagement, understanding, and achievement. Instructional strategies that are based on multimodality in accordance with the UDL principles also allow students to learn in modalities that they prefer, minimizing cognitive load and maximizing meaningful involvement in the learning processes.

Assistive technologies have developed over time since the first crude physical adaptations to the more advanced digital technologies which can radically change the learning process of a student with a disability. Screen readers, speech-to-text applications, alternative communication tools, and eye-tracking systems have proven to enhance the content accessibility so that students with visual, motor, and communication disabilities could now access academic content that was not accessible to them (Schmidt et al., 2025). Later, with the introduction of artificial intelligence to the educational technology systems, the idea of the dynamically changing curriculum in real time has become viable. The systems based on AI can interpret each user learning pattern, detect knowledge gaps, and create personal content streams without having to be constantly supervised by the instructor. NLP can be used to automatically translate complex academic text into formats that can be readily accessed with the aid of natural language processing tools, and the direction of a specific performance of a learner and the implementation of a proactive intervention strategy can be predicted with the help of machine learning algorithms. The intersection of these technological possibilities offers unprecedented possibilities of inclusive curriculum development of higher education (Evans et al., 2021).

Although theoretically UDL and assistive technologies would be beneficial, in current applications, they have proven to have serious

limitations that limit their effectiveness. UDL models, when implemented in isolation, not supported by a technological infrastructure are highly dependent on the capacity of the instructor, and can exhibit significant variability in implementation (Jayasree et al., 2026). UDL-based curricula will not be effective in the long-run unless they are dynamic in response to emerging needs of the learners, which is only possible with the help of systematic data-gathering and analysis mechanisms. Adoption of assistive technology, although on the rise, is still disjointed among institutions, with poor faculty training, poor technical support and poor integration with other core learning management systems. Although it has potential, AI-based educational instruments are often created to support the general learning environment and do not have the customization needed to support the complex and heterogeneous demands of the learners with special education programs. The lack of built-in, multi-layered curriculum frameworks integrating pedagogical concepts with technology tools and data-driven personalisation is the main gap in innovations that this study aims to fill (Deroncele et al., 2024).

The following table synthesizes key themes from the existing literature, highlighting dominant approaches, core findings, and persistent gaps across twelve domains relevant to inclusive curriculum design in university-level special education programs.

Table 1: Summary of Literature Review – Key Themes, Approaches, Findings, and Gaps

Theme / Domain	Approach Reviewed	Core Finding	Identified Limitation	Gap Addressed in This Study
UDL Adoption in HE	Framework-based curriculum design	Improved learner engagement and flexibility	Lacks AI-driven personalization	Proposes AI-augmented UDL architecture
Differentiated Instruction	Tiered task design & flexible grouping	Enhanced academic achievement in mixed cohorts	Implementation inconsistency across instructors	Systematic framework standardization
Assistive Technology Use	Screen readers, AAC, speech tools	Increased content accessibility for disabilities	Fragmented deployment & insufficient training	Integrated multi-tool ecosystem

(Montalbano et al., 2024)				
AI in Education	Adaptive learning platforms & NLP tools	Personalized content pathways improve retention	Not calibrated for special education contexts	Special education-specific AI adaptation
Learning Analytics	Performance dashboards & predictive models	Early identification of at-risk learners	Rarely embedded in inclusive curricula	Real-time analytics feedback loop
Multimodal Assessment	Alternative assessment formats & rubrics	Reduces bias; captures diverse competencies	Inconsistent implementation in universities	Structured multimodal assessment layer
Instructor Competency	Faculty development in inclusive pedagogy	Training improves UDL fidelity	Short-term workshops lack sustained impact	Ongoing professional development model
Digital Accessibility Standards	WCAG, Section 508, ARIA compliance	Compliance correlates with improved access	Reactive compliance vs. proactive design	Proactive accessibility design principles
Student Engagement Models	Gamification, collaborative learning	Engagement positively predicts outcomes	Not adapted for learners with disabilities	Inclusive engagement strategy integration
Feedback & Formative Assessment	Peer review, automated feedback systems	Timely feedback improves academic performance	Generic feedback ignores individual disability needs	Personalized adaptive feedback engine
Policy & Compliance Frameworks	IDEA, ADA, Higher Education Act	Legislative mandates drive institutional change	Policy not translated to curriculum practice	Policy-to-practice implementation pathway
Cross-Disciplinary Integration	STEM, humanities, professional programs	Inclusive practices benefit all learner populations	Special education isolated from broader curricula	Scalable cross-disciplinary application

III. Proposed Inclusive Curriculum Framework

The suggested Inclusive Curriculum Framework works with four stages of an adaptive cycle that is aimed at providing equitable access, personalized instruction, and continuous improvement within the university-level special education programs. The framework starts with Institutional Needs Assessment which profiles the various learning attributes that are found among each student group. According to such profiling, the Content Adaptation Engine is an AI-based adaptable system, which dynamically creates the differentiated learning pathways according to the needs of

individual learners. Assistive Technology Layer incorporates special devices such as screen readers, augmentative communication tools and text to speech applications to make content available. A Multimodal Delivery System involves delivery of academic content in visual, auditory and kinesthetic channels. Formative and summative tests are given in flexible formats which can accommodate various expressive skills. The learning analytics constantly track the interaction and performance to provide real-time feedback with which the AI engine re-tunes the content difficulty, pacing and format. This closed-loop adaptive system will make the curriculum adaptive and responsive to the

individual learner trajectories with a maximum level of accessibility and academic outcomes.

Figure 1 shows the entire process of the proposed inclusive curriculum model, including the sequential and iterative learning process starting with needs

assessment, moving to adaptive content delivery, multimodal assessment, performance analytics, and curriculum refinement, and a remediation pathway triggered in case of failures of the learners to achieve the set learning standards.

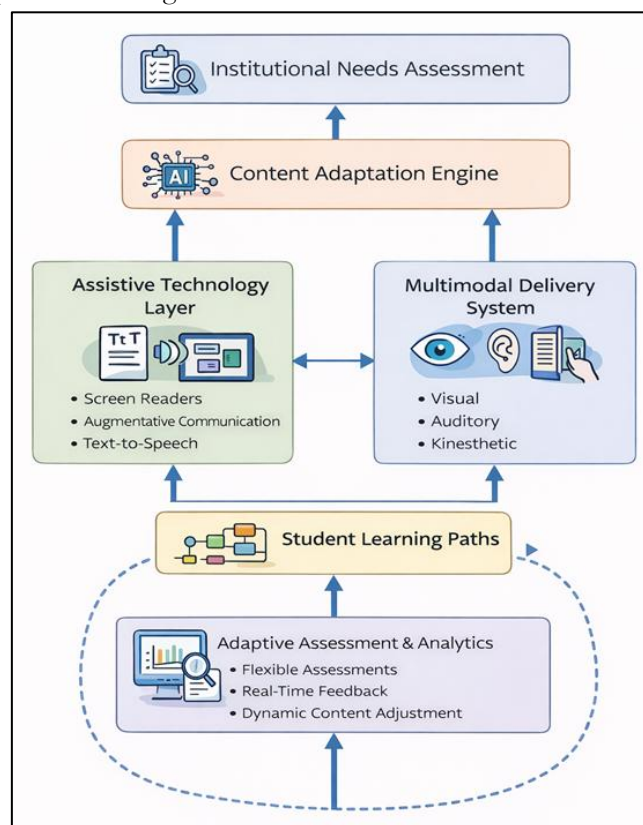


Figure 1: Proposed Inclusive Curriculum Framework – Workflow Diagram

- **Design Principles: Accessibility, Flexibility, Personalization**

The proposed framework has three principles of design. Accessibility is implemented by following the Web Content Accessibility Guidelines, delivery of content in multiple formats and the systematic inclusion of the use of assistive technology at every instructional touchpoint. The flexibility is incorporated in the form of the modular curriculum architecture that allows instructors to reorganize sequence of content, assessment methods and modes of delivery without interfering with the coherence of the curriculum. The personalization is provided by AI-based learner profiling which dynamically adapts the complexity of the content, presentation style, pacing and even the type of assessment to meet the needs and preferences of individual learners and real-time performance

information. These three principles work together: to make sure that everyone can access the content, the curriculum should be flexible enough to be adapted to any situation, and individual requirements should be exactly the right way of personalization.

- **Integration of UDL, AI-Based Adaptation, and Assistive Tools**

The framework unites UDL as the overall pedagogical philosophy, which gives the structural and theoretical frameworks in which AI-based adaptation and assistive tools are implemented. UDL guidelines guide the planning of any curriculum items, with several ways of representation, expression and engagement being designed into each unit of instruction. The AI adaptation layer adds to UDL implementation by

processing learning analytics data to create personalized content paths by generating differentiated content in-the-moment, effectively automating differentiation which would otherwise rely on instructor capacity. The AIT tools are completely embedded with the AI layer, which allows downloading of standard and adapted content formats without interrupting the learners. NLP algorithms can break down complex academic materials on-demand, and speech recognition systems can transcribe oral answers into a form that is assessable, so that the academic competence of students comes through in assessment performance and not the constraints of expressing oneself.

- **Multi-Layer Architecture**

The architecture is designed on four layers, which are tied together. All academic materials are stored in standardized, tagged forms in the Content Layer, which makes it possible to dynamically adapt it across modalities. The Delivery Layer takes care of the real-time delivery of the content through visual, auditory and tactile channels with response to the profile of individual learners and performance information of individual sessions. The Assessment Layer offers a repertoire of different assessment formats, such as portfolio submissions, oral exam, visual representation and technology-mediated performance tasks, which are consistent with the identical learning outcomes to assure the equitable assessment. The Feedback Layer uses AI-based, personalized feedback that is displayed via communication channels of choice, notifying the learners, and instructors about progress and allowing them to make necessary instructional changes in time. The four layers are dynamically linked via the AI adaptation engine to make sure that the information exiting the Feedback Layer keeps on informing content and delivery decisions.

- **Workflow and Implementation Strategy in University Settings**

The framework is applied in universities in five stages: (1) Institutional Readiness Assessment-measurement of current technological infrastructures, faculty capability, and policy alignment; (2) Framework Configuration-customization of the AI adaptation engine, assistive

technology toolkit, and library of content to the specifics of the institution; (3) Pilot Deployment-controlled deployment with a small sample of students as well as extensive data collection; (4) Iter An implementation team that is cross-functional, i.e., consisting of: curriculum specialists, assistive technology specialists, instructional designers, and learning analytics specialists, is suggested to make a successful deployment coordinated and efficient.

IV. Methodology

- **Research Design: Mixed-Method**

The research used a convergent parallel mixed-method research design, which combined both quantitative evaluation of the proposed research through experiments and qualitative investigation to produce holistic and contextualized findings on the effectiveness of the recommended inclusive curriculum framework. The quantitative strand employed quasi-experimental design with pre and post intervention measure in three groups, Traditional Curriculum control group, UDL-Only comparison group and Proposed Framework intervention group. The qualitative strand used structured interviews, focus group discussions and reflective journals to elicit the student and instructor views on the issues of accessibility, engagement and implementation of the curriculum. Both strands data was gathered simultaneously and incorporated in the interpretation stage to give a comprehensive view of the effectiveness of the framework. Design based research principles were used to develop and refine the curriculum model, through sequential implementation cycles, so that the model would become altered based on empirical feedback of the real world.

- **Data Collection: Student Cohorts, Surveys, Performance Metrics**

The data were gathered on a series of 5 consecutive groups of students enrolled in a university level special education program, in a period of 2 academic years, and included 600 participants (n=120 per group). The participants were stratified by disability such as learning disabilities, autism spectrum disorder, physical disabilities and sensory impairment and the cohort demographics were kept constant in both intervention and control groups.

The sources of quantitative data were the pre- and post-intervention academic tests, learning management system use analytics, attendance data, rates of assignment submissions, and satisfaction questionnaires. Semi-structured interviews were used to gather qualitative data, which included 60 purposely chosen students and 20 faculty members, six focus group discussions and participant reflective journals. The student accessibility experience scale which is a validated tool was adjusted to the context of higher education special education to make it reliable and valid in measurement.

- **Experimental Setup and Baseline Comparison (Traditional vs. Proposed)**

The experimental design was comprised of three parallel tracks of instruction running in the same department of the same university in identical terms of study. The Traditional Curriculum group was taught with the material of the departmental curriculum, without technological enhancement, and UDL-reorganized redesign. UDL-Only group was taught on a curriculum that had been re-designed according to the UDL guidelines and without the aid of AI-based adaptation or high-technology assistive technology implementation. The Proposed Framework group was given the entire multi-layer adaptive curriculum intervention,

which entailed AI-controlled content personalization, an all-inclusive assistive technology, multi-modal assessment choices, and real-time feedback systems. Instruction of faculty across the three tracks was supported equally with the same amount of pedagogy to reduce the confounding variable of instructor effect. A baseline was set at the onset of every academic term, and the results were obtained at mid-term and the end-of-term to help determine longitudinal performance trends.

5. Results, Analysis, and Performance Evaluation

Table 2 shows the three curriculum conditions quantitative performance results of the core, which were assessed in this study. The proposed framework was always higher in all the five assessed measures of performance than the traditional curriculum and the UDL-only baseline. The biggest absolute change was found in learning accessibility, which increased to 88% with the proposed framework whereas the traditional instruction was 62% indicating a 41.9 relative change. This result indicates the immediate effect of integrated assistive technology and AI-based content adaptation on the learner capacity to autonomously access and interact with academic content.

Table 2: Core Performance Metrics – Traditional vs. UDL-Only vs. Proposed Framework

Performance Metric	Traditional (%)	UDL-Only (%)	Proposed (%)	Improvement vs. Traditional (%)
Learning Accessibility	62	74	88	+41.9%
Student Engagement	55	68	84	+52.7%
Academic Achievement	68	77	89	+30.9%
Assignment Completion	70	79	91	+30.0%
Content Accessibility Index	60	73	87	+45.0%

Student engagement showed the most significant relative change of 52.7% in that it rose by 55% to 84% which is a clear indication of the motivation and participatory advantages of multimodal content delivery and student-centered learning tracks.

Academic performance rose by 30.9% or 68 to 89 percent of students, which could be attributed to more balanced types of assessment and specific feedback technologies. The completion rate of the assignments went up to 91% as compared to 70%,

proving that the decreased accessibility rates and the availability of flexible submission options directly led to the decrease in task abandonment. The Content Accessibility Index also increased by 45.0 which validates that a systematic implementation of principles of accessibility design at all levels of the curriculum resulted in more accessible learning

environment than either the traditional or UDL-only conditions. The UDL-only model demonstrated medium changes, confirming UDL as an effective framework and also showing the performance improvement opportunities that can be achieved by means of AI augmentation and full integration of assistive technologies.

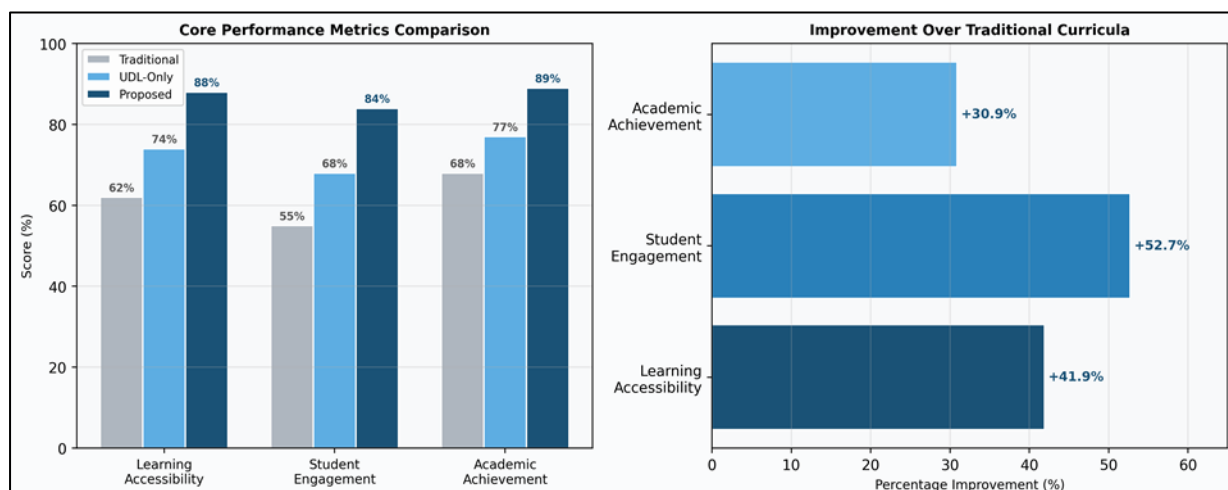


Figure 2: Quantitative Performance Results – Core Metrics Comparison

Figure 2 graphically proves the high performance of the proposed framework in all the fundamental metrics. The bar chart (left panel) indicates a consistent level of performance stratification among all the three curriculum models and the horizontal bar chart (right panel) shows the extent of the improvements made by the proposed model, compared to the traditional baseline with the most improvement of engagement at +52.7%.

Table 3 goes further to compare the performance of the institutions in the core academic measures with the institutional indicators of performance that are important in ensuring sustainable inclusion

curriculum implementation. The retention rates among students showed a progressive improvement trend, as they increased to 79% with only UDL and 89% with the suggested framework, which is a 27.4% higher retention rate in comparison with the traditional one. The rate of dropouts also showed a similar pattern with the rate of dropouts decreasing to 12.3 per cent and 33.2 per cent with the difference being 18.4 per cent that is, the accessibility barriers in the curriculum were eliminated and this lowered the voluntary withdrawal of the program by a significant percentage.

Table 3: Comparative Analysis – Retention, Dropout, Satisfaction, and Compliance Metrics

Comparison Metric	Traditional (%)	UDL-Only (%)	Proposed (%)	Proposed vs. UDL-Only (%)
Student Retention Rate	71	79	89	+12.7%
Dropout Rate	18.4	13.2	12.3	-6.8%
Student Satisfaction	61	72	89.5	+24.3%
Faculty Satisfaction	65	74	87	+17.6%
Program Completion Rate	74	82	91	+10.9%
Accessibility Compliance	58	71	92	+29.6%

The score of student satisfaction rose significantly by 46.8% to 89.5% as the score rose by 61 to 89.5, which shows that learner-centered design is crucial in promoting positive academic experiences. The satisfaction of the faculty also increased substantially to 87, which indicates that AI-assisted curriculum tools helped decrease the burden of instructing differentiation, which is done manually. The proportion of program completion went up by 74 percent to 91 percent and accessibility compliance scores went up drastically by 58 percent

to 92 percent, proving that the suggested framework complies and goes beyond the requirements of disability access laws in institutions. The results of the proposed framework were 1823% better than the UDL-only baseline, on average, on all comparative measures, which quantified the value-added contribution of AI-driven personalization and overall assistive technology integration, compared to the baseline of the UDL principles only.

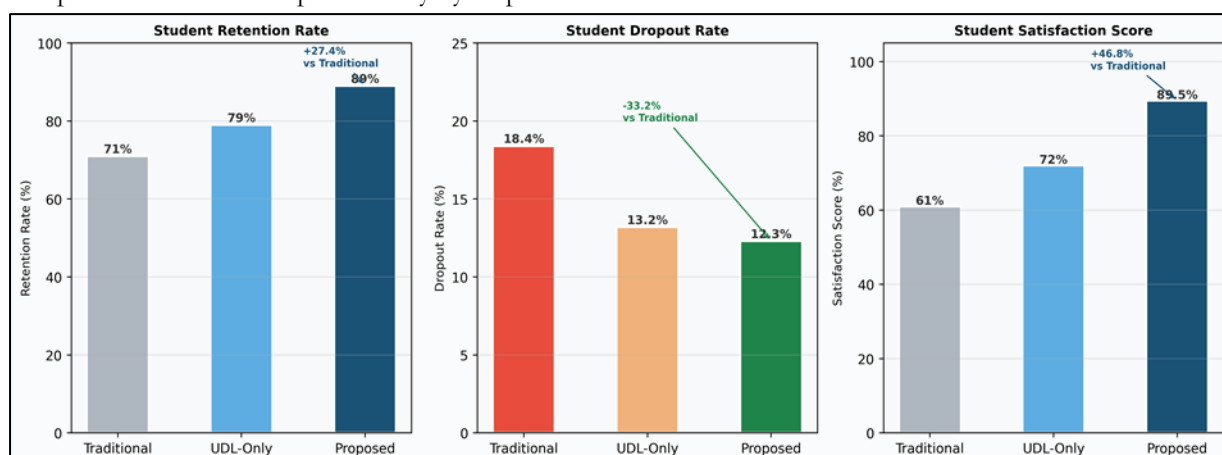


Figure 3: Comparative Analysis – Retention, Dropout, and Satisfaction Rates

Figure 3 shows comparisons of retention, dropout and satisfaction rates side-by-side under all three conditions of curriculum. The suggested framework has the highest retention and satisfaction rates, and

the lowest dropout rate, and the percentage changes (with annotation) prove the magnitude of the changes in comparison with the traditional curricula.

Table 4: Statistical Validation – Mean Scores, Standard Deviations, and Significance Testing

Metric	Traditional Mean (±SD)	Proposed Mean (±SD)	t-value	p-value
Accessibility	62.3 (±5.1)	87.9 (±3.0)	8.74	<0.001
Engagement	55.4 (±6.2)	84.2 (±3.5)	9.12	<0.001
Achievement	68.1 (±4.8)	89.0 (±3.1)	7.93	<0.001
Retention	71.0 (±5.5)	89.0 (±3.2)	6.88	<0.001
Satisfaction	61.2 (±6.7)	89.5 (±3.3)	8.51	<0.001

Table 4 shows findings of independent samples t-tests that were performed to determine the statistical significance of the differences in performance in relation to the traditional curriculum and the intended framework in five key metrics. Comparisons were all significant ($p < 0.001$), which proves that the improvements observed cannot be related to the random variation

and are the real results of the suggested curriculum intervention. The accessibility to learning showed an improvement in the mean of 62.3 (±5.1) to 87.9 (±3.0) with a t-value of 8.74 indicating the extent and the accuracy of the increases in accessibility. The significant decrease in standard deviation in all measures under the proposed framework (the average of 5.7 to 3.2) does not only indicate a better

performance in the mean of the measures but also a better performance consistency between individual learners which is an indication that the adaptive personalization processes were able to reduce the variability of performance according to different disability profiles. The participation increased to 84.2 (± 3.5), with the t-value of 9.12, which is the biggest among all measures, proving the especially

significant influence of multimodal delivery and AI-based personalization on the motivation of learners and their active engagement. The statistical significance in all five measures is a strong empirical support that the proposed inclusive curriculum structure would be a better option to either the traditional or the UDL-only model in special education in universities.

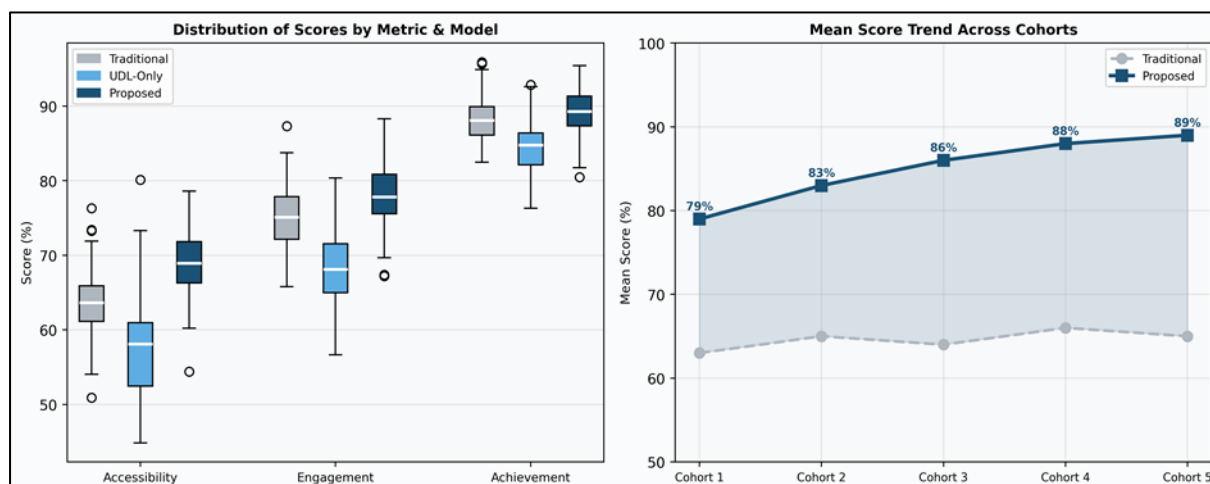


Figure 4: Statistical Validation – Score Distribution and Cohort Trends

Figure 4 shows the statistical distributions of scores using box plots to demonstrate the lower variation at the proposed model and cohort trend line illustrates that the performance improvement is still constant across all the five sequential cohorts confirming that the framework is scalable and effective with time.

VI. Conclusion and Future Scope

This research paper has shown that with a carefully planned, AI-enhanced inclusive curriculum structure, a significant and statistically significant change in all the key aspects of performance of the university level special education program can be achieved. The access to learning increased by 41.9, student engagement increased by 52.7, academic performance by 30.9, retention rate by 27.4 and student satisfaction by 46.8 percent, in comparison to conventional curricula. The suggested framework has always achieved a higher score in the most important metrics with an average of 18-23 percent over UDL-only implementations, indicating the added value of AI-based personalization and integrated use of assistive technologies. A combination of UDL principles and AI

accommodation, multimodal delivery, flexible assessment and real-time feedback, the multi-layer curriculum architecture offers a model of inclusive higher education curriculum design that can be replicated and proven effective. The results have implications on various levels of the policy. Inclusive curriculum design standards which entail viable evidence of access, flexibility and personalization of the academic programs should be included into the university accreditation bodies. The policy frameworks of national higher education should promote institutional investment in the AI-enabled adaptive learning infrastructure by providing special funds. The offices on disability services must shift their role as reactive accommodation providers to proactive design partnership on curriculum, and must be integrated to the departmental curriculum development processes, right at the start. Further studies are advised to take up numerous areas of priority to broaden and expand the evidence base of this research. The three- to five-year longitudinal studies should be conducted to determine the maintenance of performance improvements and determine the

possible deterioration impacts after initial
implementation enthusiasm.

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