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AI-Enhanced Audiobook Adoption Among Differently-Abled University Students in Sri Lanka: A Systematic Review and Theoretical Integration

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Abstract

The rapid integration of Artificial Intelligence (AI) into educational technologies has significantly expanded opportunities for inclusive learning. Among these innovations, AI-enhanced audiobook systems featuring neural text-to-speech synthesis, adaptive narration, personalized content recommendations, and intelligent summarization offer transformative potential for differently-abled university students. Despite global advancements, limited empirical and theoretical synthesis exists regarding audiobook adoption in developing-country higher education contexts, particularly in Sri Lanka. This paper systematically reviews interdisciplinary literature spanning digital accessibility, assistive technologies, audiobook pedagogy, technology acceptance theories (TAM and UTAUT2), disability studies frameworks, and Structural Equation Modeling (SEM) applications. The review follows PRISMA 2020 guidelines and is grounded in a documented search protocol across five electronic databases. The review identifies critical theoretical gaps, including the absence of integrated AI accessibility adoption models and limited South Asian empirical validation. Building upon these findings, the paper proposes an extended UTAUT2-based conceptual framework incorporating AI-generated personalization and Institutional Readiness as novel constructs. The proposed framework is visualized as a structural path model and discussed in relation to its implications for disability services, edtech design, and inclusive education policy in Sri Lanka and comparable developing country contexts. The study contributes to technology adoption scholarship, inclusive education policy discourse, and AI-driven accessibility research.

Keywords

AI in education, Audiobook Technology, Disability Inclusion, TAM, UTAUT2

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Introduction

Digital transformation in higher education has accelerated significantly over the past decade, driven by the convergence of artificial intelligence, adaptive learning systems, cloud-based content delivery, and smart digital libraries. These advances have not only altered pedagogical norms but have also reshaped expectations around learner equity, participation, and institutional responsibility. For differently-abled students, particularly those with visual impairments, dyslexia, mobility limitations, and cognitive learning disabilities, AI-enhanced audiobook systems provide alternative access pathways that are closely aligned with the principles of inclusive education and Universal Design for Learning (CAST, 2018).

In developed nations, digital accessibility frameworks are increasingly embedded within higher education policy architecture. Institutions in the United States and the United Kingdom operate under legislative mandates such as the Americans with Disabilities Act (1990) and the Disability Discrimination Act (1995), which compel systematic accessibility compliance. In contrast, developing countries, including Sri Lanka, demonstrate considerable variability in their legal and operational responsiveness to accessibility obligations. Sri Lanka's Protection of the Rights of Persons with Disabilities Act No. 28 of 1996 prohibits discrimination in educational admissions, and the 2003 National Policy on Disability defines inclusive education as the system's capacity to respond to diverse learner needs (Ministry of Social Welfare, 2003). However, the UNDP and WHO 2022–2023 National Citizen Survey confirms that persons with disabilities continue to face significant physical, attitudinal, and infrastructural barriers to quality higher education (UNPRPD, 2025). A 2022 analysis of Sri Lanka's national education policy framework found that as of 2021, computer literacy stood at only 34.3% nationally, with desktop and laptop ownership as low as 4.1% in estate areas, conditions that profoundly constrain any digital accessibility initiative (Civil Society Fund, 2023).

AI-enhanced audiobooks represent a qualitatively distinct intervention compared to conventional audio recordings. These systems leverage neural text-to-speech synthesis, natural language processing, adaptive pacing, and personalized content recommendation algorithms to create dynamic, learner-responsive audio experiences. Artificial Intelligence (AI) is a rapidly advancing field of technology that has proven to be beneficial in education and has the potential to greatly

enhance teaching and learning experiences (Samarasinghe & Prasangani, 2023). Students with disabilities in higher education are increasingly engaging with AI-powered tools for academic tasks. Holloway et al. (2025) surveyed 124 university students with disabilities, primarily those with ADHD, dyslexia, dyspraxia, and autism, and found widespread use of AI-powered chatbots and rewriting applications, though concerns about inaccuracy, academic integrity risks, and cost barriers were prominent. A systematic review by García et al. (2025) further confirms that AI enhances accessibility through adapted materials and personalized curricula delivery, provided that systemic challenges around digital inequality and personnel training are proactively addressed.

Despite this potential, the scholarly literature reveals a fragmented understanding of how AI-enhanced audiobooks are adopted within disability inclusive university settings in South Asian contexts. While TAM and UTAUT2 have been widely validated across general educational technology adoption studies (Al Maroof et al., 2024; Scherer et al., 2019), limited scholarship has examined how these models accommodate the distinct sociotechnical dynamics of assistive technology (AT) adoption among differently abled learners. Furthermore, the role of AI personalization as a discrete adoption determinant has not been theoretically formalized within existing frameworks. Critically, no published UTAUT2-based study has been validated with differently-abled university students in Sri Lanka, a gap confirmed by a systematic search of five electronic databases yielding no qualifying studies from this national context (see Section 1.1 for search protocol).

This paper addresses these gaps through three interrelated objectives: (1) to critically evaluate global and regional research on digital accessibility and assistive technologies in higher education; (2) to examine theoretical foundations underpinning technology adoption in disability inclusive educational contexts; and (3) to propose an integrated, extended conceptual framework tailored to AI-enhanced audiobook adoption among differently-abled university students in Sri Lanka. The proposed model draws on UTAUT2 while incorporating novel constructs derived from AI research, institutional readiness theory, and disability studies. The framework is presented as a visualized structural model (Figure 1) to support empirical operationalization in future research.

Systematic Review Methodology

This review follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) guidelines (Page et al., 2021). The search was conducted across five electronic databases: Web of Science, Scopus, ERIC, PsycINFO, and Google Scholar. Search terms were structured around three concept clusters: (1) AI and educational technology ("artificial intelligence", "AI enhanced", "text to speech", "audiobook", "neural TTS"); (2) disability and inclusion ("differently abled", "disability", "visual impairment", "dyslexia", "assistive technology"); and (3) technology adoption and higher education ("UTAUT", "TAM", "technology acceptance", "university", "higher education"). Boolean operators (AND/OR) were applied across clusters. The search covered publications from January 2013 to March 2026.

Inclusion criteria: (a) peer-reviewed empirical studies or theoretically grounded conceptual papers; (b) focus on technology adoption, AT use, or digital accessibility in higher education; (c) relevance to AI-enhanced tools, audiobooks, or assistive technologies for learners with disabilities; (d) written in English. Exclusion criteria: (a) studies focused solely on primary or secondary school settings without higher education components; (b) non-peer-reviewed grey literature used as primary evidence (contextual policy documents are cited descriptively only); (c) studies focused exclusively on general (non disability) populations without accessibility implications. A total of 47 sources met inclusion criteria and form the primary evidence base. Grey literature (national policy reports, government circulars) is used solely to contextualize the Sri Lankan policy environment and is not treated as primary empirical evidence.

Digital Accessibility in Higher Education

Digital accessibility refers to the design, development, and deployment of digital systems that can be accessed, navigated, and used effectively by individuals with diverse functional abilities (W3C, 2018). In higher education, accessibility encompasses the full spectrum of digital touchpoints: learning management systems (LMS), digital repositories, e-books, multimedia content, asynchronous course materials, and online assessments. The Web Content Accessibility Guidelines (WCAG 2.1) articulate internationally recognized standards of perceivability, operability, understandability, and robustness that form the benchmark for accessible digital design (W3C, 2018).

Empirical research consistently reveals persistent and troubling gaps between institutional accessibility policy adoption and practical implementation that deserve critical scrutiny rather than simple cataloguing. Lazar et al. (2015) documented that even institutions with formal accessibility policies exhibited significant WCAG compliance failures in high-traffic digital environments. Seale (2013) argues that higher education institutions frequently demonstrate symbolic compliance, the superficial adoption of accessibility standards without systemic integration into institutional culture, curriculum design, or procurement decisions. This analysis has significant implications: it suggests that the problem is not primarily technical but political and cultural. Accessibility failures in higher education are not best understood as isolated oversights to be corrected by better software; they reflect institutional cultures that have not internalized disability inclusion as a core organizational value. This structural reading aligns with the Social Model of Disability (Oliver, 1990), which locates the production of disability in disabling environments rather than individual impairments.

A systematic review by Batanero et al. (2022), covering 31 empirical studies over a decade, found that poor AT adoption in higher education was consistently driven by incompatible software, LMS platforms lacking accessibility features, and the absence of learner-centered procurement decisions. Critically, these barriers were not random: they clustered in institutions with weaker governance commitment to accessibility, lower financial capacity for specialist infrastructure, and limited technical expertise among academic staff. This pattern suggests that institutional-level factors are not merely contextual conditions influencing the adoption of Assistive Technologies (AT); rather, they serve as critical determinants of whether individual-level adoption attitudes can be effectively translated into sustained and meaningful use. The findings indicate that positive perceptions and intentions at the individual level are unlikely to result in long-term adoption in the absence of supportive institutional structures, resources, and policies. This theoretical insight provides a strong rationale for the inclusion of the Institutional Readiness construct within the proposed conceptual framework, positioning it as a central mechanism that enables the transformation of individual adoption intentions into sustained technology utilization.

Within the Sri Lankan context specifically, the 2023 National Policy on Disability and the Ministry of Education's Circular 33/2022 represent meaningful policy milestones (Ministry of Education, 2022). Yet implementation consistently lags behind legislation. The Civil Society Fund (2023)

reports that as of 2023, only 8.6% of Sri Lankan schools had incorporated special education units, and 23.5% of children aged 5–14 with disabilities remained excluded from mainstream education altogether. It is important to note that these figures derive from grey literature sources and should be interpreted with appropriate caution; nonetheless, they are consistent with UNPRPD (2025) findings and with the broader pattern documented in the peer-reviewed literature on developing country accessibility gaps (Batanero et al., 2022). The UNPRPD (2025) situational analysis further confirms that accessibility compliance remains inadequate across ICTs and public institutions, and that disability services remain fragmented and underfunded. This structural context underscores why institution-level audiobook ecosystems in Sri Lankan universities remain theoretically underexplored and empirically unvalidated.

Assistive Technologies and AI-Enhanced Audiobook Systems

Assistive technologies (AT) encompass devices, software applications, and systems designed to enhance the academic and social participation of individuals with disabilities by compensating for functional limitations. A landmark systematic review by McNicholl et al. (2021) examining AT impact on educational and psychosocial outcomes in higher education found that AT use enabled meaningful academic engagement and social participation, while also highlighting that inadequate training, device limitations, and poor institutional support can significantly hinder effective use. Batanero et al. (2022) similarly confirmed that AT use was successful in increasing inclusion and accessibility for students with disabilities, but that barriers, particularly inadequate teacher training, restricted institutional awareness, and cost constraints, consistently moderated outcomes. Together, these reviews provide a consistent empirical picture: AT adoption is not determined by device availability alone, but by the quality of the institutional ecosystem within which devices are embedded.

Audiobooks occupy a distinct position within the AT ecosystem, functioning simultaneously as accessibility tools and as pedagogically legitimate learning resources. For students with visual impairments, audiobooks provide primary content access in the absence of readable text. For students with dyslexia, they support phonological processing, decoding fluency, and reading comprehension by delivering text through auditory channels. Gustafsson et al. (2023), in a five-year longitudinal study tracking dyslexic students' AT experiences in Sweden, found that audiobooks and text-to-speech tools were experienced as beneficial for vocabulary expansion and

text comprehension when instruction in listening strategies was explicitly provided. Importantly, the study identified a significant emotional and identity dimension: students who had come to accept dyslexia as part of their identity reported consistently positive and sustained AT use, while those who had not were more likely to avoid AT in classroom contexts. This finding introduces an important qualification to adoption models based solely on cognitive beliefs: emotional and identity-related factors can constitute significant moderators of behavioral intention that standard TAM and UTAUT2 constructs do not capture directly.

Empirical evidence directly validating the reading comprehension benefits of text-to-speech (TTS) tools, the acoustic core of AI-enhanced audiobooks, is accumulating. Keelor et al. (2023) conducted a controlled study examining TTS effects on children with dyslexia and reading language impairments and found that TTS conditions produced significantly higher comprehension scores compared to silent reading, with students with dyslexia deriving the greatest benefits. While Keelor et al.'s sample was drawn from compulsory education, their findings have a plausible theoretical extension to adult learners in higher education, given the neurological basis of dyslexia related processing challenges across the lifespan, though direct validation with university populations remains needed. Holloway et al. (2025) found widespread adoption of AI-powered writing and accessibility tools among university students with disabilities, though inaccuracy concerns, academic integrity risks, and subscription cost barriers were identified as significant adoption challenges.

The theoretical grounding for AI-enhanced audiobook systems draws on well-established cognitive science frameworks, though these frameworks require careful translation to adult disability inclusive learning contexts. Dual Coding Theory (Paivio, 1986) posits that information processed through both verbal and nonverbal channels results in stronger encoding and recall than single-channel processing alone. However, it is worth noting that Paivio's original framework was developed with neurotypical participants, and the extent to which dual coding dynamics operate identically for individuals with visual processing impairments or significant dyslexia related phonological deficits is an empirical question that the accessibility literature has only partially addressed. AI-enhanced audiobooks paired with synchronized text highlighting engage dual coding principles by simultaneously activating auditory verbal and visual symbolic processing pathways, a benefit most likely to accrue to students whose visual processing is intact.

Cognitive Load Theory (Sweller, 1988), which distinguishes among intrinsic, extraneous, and germane cognitive load, provides a complementary rationale: by managing these components through adaptive pacing and content calibration, AI-enhanced audiobook systems maintain learner engagement within optimal processing zones. Again, this argument requires empirical qualification for disability specific contexts. Students with cognitive processing differences (e.g., ADHD related attentional dysregulation) may experience cognitive load dynamics that differ from the framework's original assumptions, potentially requiring adaptive pacing features to work differently for different disability profiles. Mayer's (2005) multimedia learning framework, which extends Sweller's insights to audio-visual design, provides additional support for the accessibility value of well-designed AI-enhanced audiobooks. Together, these cognitive frameworks provide theoretical grounding while also motivating the need for empirical validation with the specific population of interest.

Technology Adoption Theories in Inclusive Educational Contexts

Technology Acceptance Model (TAM)

The Technology Acceptance Model, introduced by Davis (1989), remains the most extensively validated framework for explaining user adoption of information systems. TAM posits that Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) are the primary antecedents of behavioral intention and actual system use. Scherer et al. (2019), in a meta-analytic structural equation modeling study synthesizing TAM applications across teacher technology adoption, confirmed that PU and PEOU consistently and significantly explained behavioral intention across diverse technological and institutional contexts, with meta-analytic findings demonstrating that TAM-based models typically explain between 40% and 66% of variance in technology usage intention.

However, TAM's parsimony simultaneously limits its capacity to capture the contextual and institutional determinants that are critical in accessibility research. Three limitations deserve critical attention in the present context. First, TAM was developed in corporate information systems contexts with non disabled adult workers, and its construct definitions do not accommodate the disability specific experiential factors such as prior AT stigma, emotional acceptance of diagnosis, or differential functional capacity that moderate adoption for differently

abled learners. Second, TAM's dyadic structure (PU and PEOU as the only determinants of intention) provides no mechanism for representing the role of social environment, institutional support, or hedonic motivation, all of which have strong empirical grounding in AT adoption research (Batanero et al., 2022). Third, TAM does not distinguish between the intent to use a technology and the structural capacity to do so, a distinction that is particularly important in infrastructure-constrained contexts such as rural Sri Lanka, where facilitating conditions may suppress use even when intention is high. These limitations collectively motivate the adoption of UTAUT2 as the foundational framework for this paper.

Unified Theory of Acceptance and Use of Technology (UTAUT2)

Venkatesh et al. (2003) introduced UTAUT as an integrative model synthesizing constructs from eight competing technology acceptance theories. The subsequent UTAUT2 extension (Venkatesh et al., 2012) adapted the model for consumer-facing technology contexts, introducing Hedonic Motivation, Price Value, and Habit alongside the original constructs of Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions, achieving explanatory power of up to 74% of variance in behavioral intention. Al Maroof et al. (2024), in their meta-analytic synthesis of UTAUT2-based e-learning adoption studies, documented UTAUT2's successful application across educational chatbots, e-learning platforms, and mobile learning environments in higher education.

Meta-analytic evidence supports the model's applicability to the present context. Al Maroof et al. (2024), synthesizing 91 empirical studies involving over 37,000 participants, confirmed Performance Expectancy as the most consistently significant predictor of behavioral intention, followed by Effort Expectancy and Social Influence, with age and gender as significant moderators. A systematic review of UTAUT2 applied to AI adoption in universities by Romero Rodríguez et al. (2024), analyzing 50 studies from 2018 to 2023, found that performance expectancy and hedonic motivation were the strongest predictors, with social influence particularly salient for non-STEM learners, a finding directly applicable to differently-abled students in Sri Lankan arts and social science faculties.

Despite this strong evidence base, two limitations of UTAUT2 are particularly relevant to the present study and justify the proposed extensions. First, UTAUT2 does not natively incorporate

constructs specific to AI-powered features' personalization quality, adaptive intelligence, or algorithmic recommendation accuracy, which are central to the value proposition of next-generation audiobook systems. This omission is significant given emerging evidence that perceived AI personalization quality and algorithmic trustworthiness are direct determinants of user engagement with adaptive digital tools (Holloway et al., 2025; García et al., 2025). Second, UTAUT2's Facilitating Conditions construct captures individual-level perceptions of resource and support availability, but does not represent the organizational-level commitments, staffing, and policy infrastructure that determine whether facilitating conditions are actually present for students with disabilities in under-resourced institutions. These two gaps are addressed through the AI-generated Personalization and Institutional Readiness constructs proposed in Section 7.

Integrating Disability Studies Frameworks

The Social Model of Disability, articulated by Oliver (1990) and further developed by Barnes and Mercer (2010), provides a foundational reframing of disability as a social and structural phenomenon rather than an individual medical deficit. Within this model, disability is understood as arising from the interaction between individual impairments and disabling environmental, institutional, and attitudinal barriers, not from the impairment itself. Oliver and Barnes (2010) emphasize that the primary goal of social model-oriented practice is the removal of systemic barriers through structural change, rather than the adaptation of individuals to disabling systems.

It is important to acknowledge a significant debate within disability studies about the Social Model's limitations. Critics, including some disabled scholars writing from crip theory perspectives, have argued that the Social Model's exclusive focus on social barriers can inadvertently marginalize the lived experience of impairment, the pain, fatigue, and functional challenges that are not purely social constructions (Shakespeare, 2006). For this paper, the Social Model is adopted as an analytical orientation toward institutional and systemic barriers rather than as a complete account of disability experience. This use is consistent with the model's application in educational technology research (Seale, 2013; Batanero et al., 2022) and does not preclude attention to impairment-specific adoption factors at the individual level.

Universal Design for Learning (UDL), developed by the Center for Applied Special Technology (2018), operationalizes the Social Model within educational practice by advocating the proactive and systemic design of learning environments that accommodate the full diversity of learner

abilities. UDL's three core principles, multiple means of representation, action and expression, and engagement map directly onto the accessibility features of AI-enhanced audiobook systems. Sánchez García et al. (2025) confirm in a PRISMA-guided systematic review that AI enhances accessibility through adapted materials and personalized curricula delivery, provided that systemic challenges, including digital inequality, limited infrastructure, and inadequate personnel training, are proactively addressed. Barnes and Mercer (2010) caution that social model rhetoric frequently outpaces policy implementation, a pattern directly evidenced in Sri Lanka's persistent gap between disability legislation and institutional practice (UNPRPD, 2025).

Integrating Social Model and UDL frameworks into technology acceptance models substantially strengthens their contextual sensitivity for disability focused adoption research. Such integration shifts the theoretical focus from individual cognitive beliefs to the structural and institutional conditions under which technology adoption decisions are made, a reorientation that is both empirically warranted and ethically consonant with contemporary disability rights discourse. The proposed extension of UTAUT2 in this paper builds explicitly on this integration, with Institutional Readiness functioning as the structural construct that operationalizes Social Model insights within the UTAUT2 architecture.

Structural Equation Modelling in Adoption Research

Structural Equation Modeling (SEM) constitutes the dominant analytical methodology for validating complex latent variable models in technology adoption research. SEM enables the simultaneous estimation of measurement models assessing the reliability and validity of latent construct operationalizations and structural models evaluating directional relationships and effect sizes between constructs (Hair et al., 2022). This dual capacity makes SEM particularly well suited to theory extension studies in which multiple constructs with intercorrelated indicators must be evaluated within a unified analytical framework.

Partial Least Squares SEM (PLS-SEM) has gained particular traction in exploratory adoption research due to its capacity to produce stable estimates with smaller sample sizes and its applicability to non-normal data distributions. Hair et al. (2022) elaborate that PLS-SEM's iterative optimization approach, alternating between measurement and structural model optimization rather than analyzing all data simultaneously, makes it especially appropriate for theory development contexts with complex multi-construct models. Hair and Alamer (2022) further demonstrate that

PLS-SEM's partial approach means solutions can be obtained with smaller samples than required by Covariance-Based SEM (CB-SEM), a methodological advantage relevant to the proposed study, given the relatively small populations of differently abled registered students at individual Sri Lankan universities. CB-SEM, implemented through software such as AMOS or lavaan, remains preferred in fully confirmatory contexts where theoretical specifications are well established and sample sizes are sufficient (Sarstedt et al., 2022). For the exploratory, theory development orientation of the proposed research, PLS-SEM is the appropriate choice.

Ghasemy et al. (2020), in a comprehensive review of PLS-SEM applications in higher education research, identified a substantial concentration of studies from East Asia, the United States, and Western Europe with a marked underrepresentation of South Asian and African institutions. South Asian AT adoption research rarely employs SEM techniques; descriptive surveys and qualitative interview studies dominate the methodological landscape. This methodological gap limits the theoretical cumulation of South Asian AT adoption findings and means that no validated, context-specific quantitative model currently exists to guide AT policy decisions in Sri Lankan universities. Beyond methodology, this gap also reflects a deeper inequity: the absence of South Asian empirical contributions means that global models are implicitly calibrated to institutional and cultural contexts that may differ significantly from Sri Lankan realities including power distance cultural orientations (Hofstede, 1991), collectivist social structures, and infrastructure constraints that have no direct parallel in the North American or East Asian settings where most UTAUT2 studies have been conducted.

Identified Research Gaps

The foregoing review highlights several significant and interconnected gaps in the existing literature on AI-enhanced audiobook adoption in higher education. Rather than representing isolated omissions, these gaps indicate a systematic lack of attention to disability inclusive perspectives, AI-specific adoption dynamics, and South Asian educational contexts. Taken together, these limitations provide a compelling justification for the development of an extended conceptual framework that captures the complex interplay of technological, individual, institutional, and contextual determinants shaping adoption outcomes.

First, empirical research specifically examining AI-enhanced audiobook adoption among differently-abled university students is extremely limited globally and essentially absent within

South Asian higher education contexts. The existing empirical literature on TTS and audiobook use focuses predominantly on children in compulsory education settings (Keelor et al., 2023; Gustafsson et al., 2023). The systematic search conducted for this paper (Section 1.1) returned no qualifying empirical studies from Sri Lankan universities examining AT adoption with UTAUT2 or TAM frameworks among differently-abled student populations. Holloway et al. (2025) confirm that the emerging literature on generative AI use by students with disabilities in higher education focuses primarily on written production tasks rather than audio-based content consumption, leaving audiobook-specific adoption empirically understudied.

Second, no published study has developed or validated an integrated theoretical model combining UTAUT2 constructs with disability studies frameworks, specifically the Social Model of Disability (Oliver, 1990; Barnes & Mercer, 2010) and UDL principles (CAST, 2018), and AI-specific constructs such as personalization quality and algorithmic trust. Al Maroof et al. (2024) confirm in their meta-analytic synthesis that despite UTAUT's extensive application in higher education, disability inclusive and AI-personalization-sensitive model extensions remain absent from the published literature. The need for such integration is further highlighted by Sánchez García et al. (2025), whose systematic review of AI in inclusive education identified equitable technology design, infrastructure access, and personnel training as prerequisites that existing adoption models do not capture.

Third, quantitative validation studies employing SEM methodologies are conspicuously absent from Sri Lankan educational technology adoption research. Ghasemy et al. (2020) confirm this in their PLS-SEM review, finding virtually no contributions from South Asian institutional contexts. Without rigorous construct validation and structural model testing, it is not possible to establish the relative predictive importance of adoption determinants in this national context, nor to assess whether findings from predominantly East Asian and Western settings are transferable to Sri Lanka's distinctive cultural, infrastructural, and institutional environment.

Fourth, the concept of Institutional Readiness encompassing administrative commitment to accessibility, availability of trained disability support personnel, adequacy of technical infrastructure, and organizational culture toward disability inclusion has not been operationalized as a discrete construct within UTAUT2-based adoption studies. Batanero et al. (2022) provide extensive evidence for the centrality of institutional factors in determining whether differently-

abled students can effectively access and use AT. The UNPRPD (2025) documents that in Sri Lanka specifically, accessibility compliance remains inadequate across ICTs despite regulatory mandates. These realities demand that institutional readiness be treated as a first-class explanatory variable in any adoption model calibrated to this context.

Proposed Conceptual Framework

Drawing on the synthesized literature, this paper proposes an extended UTAUT2 framework specifically configured for investigating AI-enhanced audiobook adoption among differently-abled university students in Sri Lanka. The framework retains the core UTAUT2 constructs while incorporating two novel constructs derived from the identified theoretical gaps: AI-Generated Personalization and Institutional Readiness. The resulting eight-construct model is grounded in a deliberate synthesis of technology acceptance theory (Venkatesh et al., 2012), social model disability frameworks (Oliver, 1990; Barnes & Mercer, 2010), UDL principles (CAST, 2018), and inclusive AI design research (Holloway et al., 2025; Sánchez-García et al., 2025). The structural path model is presented in Figure 1, which visualizes the directional hypotheses, mediating pathways, and moderating role of Institutional Readiness.

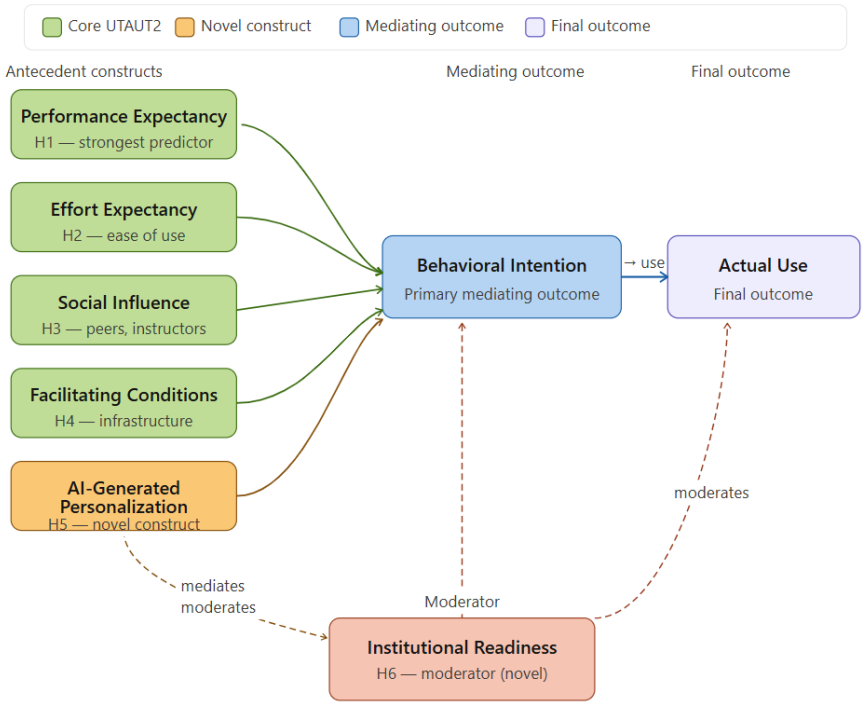

Figure 1: Extended UTAUT2 Framework for AI-Enhanced Audiobook Adoption

Construct Descriptions and Hypotheses

Performance Expectancy (H1). Performance Expectancy reflects students' beliefs about the extent to which using AI-enhanced audiobooks will improve their academic performance, comprehension, and study efficiency. Al Maroof et al. (2024) confirm that this construct demonstrates the strongest and most consistent predictive relationship with behavioral intention in UTAUT2 meta-analytic contexts. For differently-abled students, particularly those with visual impairments and dyslexia, for whom auditory learning modalities align closely with functional preferences, the expectancy of performance improvement is likely shaped by prior positive experiences with AT tools and by peer and instructor accounts of audiobook effectiveness. Keelor et al. (2023) provide direct empirical grounding: TTS-supported comprehension gains were significantly greater than silent reading for students with dyslexia, suggesting that early positive performance experiences create a self-reinforcing adoption dynamic. H1: Performance Expectancy positively predicts Behavioral Intention to use AI-enhanced audiobook systems.

Effort Expectancy (H2). Effort Expectancy captures the perceived ease of interacting with AI-enhanced audiobook platforms, including system navigation, feature accessibility, and the learning curve associated with adaptive and personalized functions. For differently-abled students who may have prior experience with simpler AT tools, basic screen readers, or standard audio players, the relative complexity of AI-enhanced systems may represent a meaningful adoption barrier. Holloway et al. (2025) found that ease of use concerns and interface complexity were among the primary barriers expressed by students with disabilities using generative AI tools in higher education. H2: Effort Expectancy positively predicts Behavioral Intention and is partially mediated by Performance Expectancy (consistent with Davis, 1989).

Social Influence (H3). Social Influence encompasses the role of peers, instructors, disability services staff, and institutional communications in shaping students' perceptions and adoption intentions. In the Sri Lankan higher education context, characterized by relatively high power distance cultural orientations supported by Hofstede's (1991) cultural dimensions framework, which provides peer-reviewed validation of power distance scores across national cultures, social influence from institutional authorities is hypothesized to exert particularly significant effects on adoption behavior. Al Maroof et al. (2024) identified Social Influence as a robust predictor of e-learning behavioral intention, particularly in developing country contexts and among female

students. H3: Social Influence positively predicts Behavioral Intention, with stronger effects for students in high power distance institutional environments.

Facilitating Conditions (H4). Facilitating Conditions operationalizes the quality of support infrastructure available to students, including reliable internet connectivity, device access, platform technical support, and training provision. Batanero et al. (2022) document that inadequate facilitating conditions, particularly insufficient institutional support and cost constraints, are among the most frequently cited barriers to AT adoption by students with disabilities globally. In the Sri Lankan national context, where the Civil Society Fund (2023) estimates home broadband coverage at approximately 8.9% of surveyed households (a grey literature figure reported descriptively), Facilitating Conditions are hypothesized to function as a critical moderator of the relationship between Behavioral Intention and Actual Use, constraining even strongly motivated students from converting intention into sustained use. This moderation effect is reinforced by Institutional Readiness (see below). H4: Facilitating Conditions positively predict both Behavioral Intention and Actual Use, moderated by Institutional Readiness.

AI-Generated Personalization (H5) [Novel Construct]. AI-Generated Personalization is introduced as a novel construct reflecting student perceptions of the relevance, adaptiveness, and accuracy of AI-driven content recommendations, narration adjustments, and learning analytics feedback within the audiobook system. This construct is theoretically grounded in the emerging literature on algorithm transparency, personalization effectiveness, and user trust in AI recommendations (Holloway et al., 2025; Sánchez García et al., 2025). Operationally, this construct would be measured using indicators addressing: (a) perceived accuracy of content recommendation algorithms; (b) perceived adaptiveness of narration speed and vocabulary calibration; (c) trust in AI-generated learning analytics feedback; and (d) perceived relevance of personalized content selections. These four dimensions correspond to the primary AI features distinguishing AI-enhanced audiobooks from conventional TTS systems and provide a theoretically bounded operationalization of the construct. H5: AI-generated personalization positively predicts Behavioral Intention and mediates the relationship between Effort Expectancy and Behavioral Intention alongside Performance Expectancy.

Institutional Readiness (Moderator) [Novel Construct]. Institutional Readiness is proposed as a moderating construct encompassing organizational-level determinants of accessibility adoption:

administrative commitment, dedicated disability support staffing, accessible curriculum policies, and the presence of a campus-wide digital accessibility strategy.

The theoretical rationale for modelling Institutional Readiness as a moderator rather than an antecedent or mediator rests on the following logic: Institutional Readiness does not directly cause individual adoption beliefs but instead determines the extent to which positive individual-level attitudes can translate into actual behavior. In environments with high Institutional Readiness, students with positive Facilitating Conditions perceptions and strong Behavioral Intentions will encounter fewer structural barriers to Actual Use; in low readiness environments, even highly motivated students will face systemic suppression of use.

This logic is consistent with Oliver and Barnes's (2010) social model argument that structural barriers, not individual deficits, are the primary determinants of disabled persons' participation in institutional systems. Institutional Readiness would be measured at the institutional level using existing validated instruments for organizational accessibility readiness (drawing on Seale, 2013) and aggregated to the individual student level using multi-level modeling techniques. H6: Institutional Readiness moderates the positive effects of Facilitating Conditions on Behavioral Intention and Actual Use, such that these effects are stronger at higher levels of institutional readiness.

Conclusion

This systematic review has synthesized interdisciplinary scholarship spanning digital accessibility policy, assistive technology research, audiobook learning theory, technology acceptance modeling, disability studies, and structural equation methodology. The review followed PRISMA 2020 guidelines, drawing on a documented five-database search protocol, and identified a coherent cluster of theoretical, empirical, and methodological gaps converging on a single insufficiently addressed domain: the adoption of AI-enhanced audiobook systems among differently abled university students in developing country higher education contexts.

The proposed extended UTAUT2 framework represents a theoretically grounded and contextually sensitive response to these gaps. By incorporating AI-Generated Personalization as a novel adoption determinant and Institutional Readiness as a structural moderator, the framework advances beyond existing models to capture the sociotechnical dynamics distinctive to AI-assisted

AT adoption in the Sri Lankan university context. The integration of Social Model of Disability principles (Oliver, 1990; Barnes & Mercer, 2010) and UDL guidelines (CAST, 2018) ensures alignment with contemporary disability rights discourse and inclusive education ethics — while acknowledging the Social Model's known limitations regarding impairment experience. The choice of PLS-SEM as the proposed validation methodology (Hair et al., 2022) is appropriate given the exploratory and theory development orientation of this inquiry and the small population sizes of differently-abled registered students at individual Sri Lankan universities.

The framework's structural path model (Figure 1) provides a visual specification of the proposed construct relationships, hypothesized directionalities, and moderating mechanisms that can serve as the basis for survey instrument development and empirical validation. The operationalization of AI-generated personalization through four indicator dimensions (recommendation accuracy, narration adaptiveness, analytics trust, and content relevance) and the proposed multi-level measurement strategy for Institutional Readiness provide sufficient construct specification to support the design of a validation study.

The practical implications extend beyond the theoretical contribution. Validated adoption determinants can directly inform strategic decisions by university disability services offices, academic policymakers, and edtech developers operating in the Sri Lankan and broader South Asian context, though it should be noted that such practical application must await empirical validation of the proposed framework. Future research should prioritize PLS-SEM validation of the proposed framework using data from differently-abled students across Sri Lankan universities, followed by comparative studies examining adoption patterns across disability types, institutional settings, and geographic regions. Longitudinal designs tracking adoption behavior over academic years would address the underexplored question of how AI-enhanced audiobook use becomes habitualized or abandoned over time. Qualitative studies exploring the lived experiences of differently-abled students, including their emotional relationships with their disability identities (cf. Gustafsson et al., 2023) and their navigation of AI-assisted tools within Sri Lanka's specific socio-cultural and institutional context would further enrich quantitative findings and strengthen the basis for evidence-based policy recommendations.

References

Al Maroof, R. A., Alfaisal, A. M., & Salloum, S. A. (2024). Factors influencing behavioral intention to use e-learning in higher education during the COVID-19 pandemic: A meta-analytic review based on UTAUT2. Education and Information Technologies. https://doi.org/10.1007/s10639-024-13299-2

Americans with Disabilities Act of 1990, Pub. L. No. 101–336, 104 Stat. 328 (1990).

Barnes, C., & Mercer, G. (2010). Exploring disability (2nd ed.). Polity Press.

CAST. (2018). Universal Design for Learning guidelines version 2.2. http://udlguidelines.cast.org

Civil Society Fund. (2023). Dissecting the digital focus in Sri Lanka's national education policy framework [Grey literature report]. https://www.csf-asia.org/dissecting-the-digital-focus-in-sri-lankas-national-education-policy-framework/

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly, 13(3), 319–340. https://doi.org/10.2307/249008

Disability Discrimination Act 1995, c. 50 (UK).

Fernández-Batanero, J. M., Montenegro-Rueda, M., Fernández-Cerero, J., & García-Martínez, I. (2022). Assistive technology for the inclusion of students with disabilities: A systematic review. Educational Technology Research and Development, 70(4), 1911–1930. https://doi.org/10.1007/s11423-022-10127-7

Ghasemy, M., Teeroovengadum, V., Becker, J.-M., & Ringle, C. M. (2020). This fast car can move faster: A review of PLS-SEM application in higher education research. Higher Education, 80, 1121–1152. https://doi.org/10.1007/s10734-020-00534-7

Gustafsson, E., Tärning, B., & Sunnegårdh-Grönberg, K. (2023). Dyslexic students' experiences in using assistive technology to support written language skills: A five-year follow-up. Disability and Rehabilitation: Assistive Technology, 18(8), 1217–1227. https://doi.org/10.1080/17483107.2022.2161647

Hair, J. F., & Alamer, A. (2022). Partial least squares structural equation modeling (PLS-SEM) in second language and education research. Research Methods in Applied Linguistics, 1(3), 100027. https://doi.org/10.1016/j.rmal.2022.100027

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). A primer on partial least squares structural equation modeling (PLS-SEM) (3rd ed.). Sage.

Hofstede, G. (1991). Cultures and organizations: Software of the mind. McGraw-Hill.

Holloway, D., Dezuanni, M., & Moorhouse, B. L. (2025). The use of generative AI by students with disabilities in higher education. The Internet and Higher Education, 65, 100968. https://doi.org/10.1016/j.iheduc.2025.100968

Keelor, J. L., Creaghead, N. A., Silbert, N. H., Breit, A. D., & Horowitz-Kraus, T. (2023). Impact of text-to-speech on reading comprehension. Annals of Dyslexia, 73(3), 469–486. https://doi.org/10.1007/s11881-023-00281-9

Kittinger, L., & Law, V. (2024). A systematic review of UTAUT and UTAUT2 among K–12 educators. Journal of Information Technology Education: Research, 23, 1–25. https://doi.org/10.28945/5246

Lazar, J., Goldstein, D. F., & Taylor, A. (2015). Ensuring digital accessibility through process and policy. Morgan Kaufmann.

Mayer, R. E. (2005). The Cambridge handbook of multimedia learning. Cambridge University Press.

McNicholl, A., Casey, H., Desmond, D., & Gallagher, P. (2021). Assistive technology use in higher education: A systematic review. Disability and Rehabilitation: Assistive Technology, 16(2), 130–143. https://doi.org/10.1080/17483107.2019.1642395

Ministry of Education, Sri Lanka. (2022). Reasonable accommodation for education: Code of guidelines (Circular 33/2022).

Ministry of Social Welfare, Sri Lanka. (2003). National policy on disability for Sri Lanka.

Oliver, M. (1990). The politics of disablement. Macmillan.

Oliver, M., & Barnes, C. (2010). Disability studies and inclusion. British Journal of Sociology of Education, 31(5), 547–560. https://doi.org/10.1080/01425692.2010.500088

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., … Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. BMJ, 372, n71. https://doi.org/10.1136/bmj.n71

Paivio, A. (1986). Mental representations: A dual coding approach. Oxford University Press.

Romero-Rodríguez, J. M., Aznar-Díaz, I., Hinojo-Lucena, F. J., & Cáceres-Reche, M. P. (2024). Acceptance of AI in university contexts. Heliyon, 10(18), e38098. https://doi.org/10.1016/j.heliyon.2024.e38098

Samarasinghe, K., & Prasangani, K. S. N. (2023). Reliance on AI tools and fostering creativity among Sri Lankan ESL learners: Special focus on ChatGPT. In Proceedings of the 3rd

International Conference on Educational Technology and Online Learning (ICETOL 2023) (pp. 97–101).

Sánchez-García, A. B., Marcos, J. J. M., Du, X., & González-Valero, G. (2025). AI in inclusive education: A systematic review. Education Sciences, 15(5), 539. https://doi.org/10.3390/educsci15050539

Sarstedt, M., Hair, J. F., & Ringle, C. M. (2022). Partial least squares structural equation modeling. In C. Homburg, M. Klarmann, & A. Vomberg (Eds.), Handbook of market research (pp. 587–632). Springer. https://doi.org/10.1007/978-3-319-57413-4_15

Scherer, R., Siddiq, F., & Tondeur, J. (2019). Technology acceptance model in education: A meta-analysis. Computers & Education, 128, 13–35. https://doi.org/10.1016/j.compedu.2018.09.009

Seale, J. (2013). E-learning and disability in higher education. Routledge.

Shakespeare, T. (2006). Disability rights and wrongs. Routledge.

Sri Lanka Protection of the Rights of Persons with Disabilities Act, No. 28 of 1996 (Sri Lanka). https://www.srilankalaw.lk/acts/1996-acts/protection-of-the-rights-of-persons-with-disabilities-act-no-28-of-1996/

Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. Cognitive Science, 12(2), 257–285. https://doi.org/10.1207/s15516709cog1202_4

UNPRPD. (2025). Sri Lanka situational analysis on the rights of persons with disabilities [Grey literature report]. https://unprpd.org/new/wp-content/uploads/2025/01/SriLankaSitAn.pdf

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. MIS Quarterly, 27(3), 425–478. https://doi.org/10.2307/30036540

Venkatesh, V., Thong, J. Y. L., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. MIS Quarterly, 36(1), 157–178. https://doi.org/10.2307/41410412

World Wide Web Consortium (W3C). (2018). Web Content Accessibility Guidelines (WCAG) 2.1. https://www.w3.org/TR/WCAG21/