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Universal Designs in Education: A review of the literature to inform higher education quality course development

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Abstract

Background: The principles of Universal Design (UD) have been adopted and adapted in educational settings using various frameworks over the years, including Universal Design for Learning, Universal Design for Instruction, Quality Matters, Universal Instructional Design, and Integrated Multicultural Design. Each model has nuanced differences while simultaneously complementing each other in principle and purpose for continuous improvement in collegial environments. This article examines and compares the existing literature on universal design in higher education settings. **Objectives:** This article analyzes and synthesizes multiple universal design models used in education, identifies common themes, and assesses their relevance to the field of higher education. It examines their application in diverse instructional settings such as online classrooms, graduate programs, and globally diverse cultures. **Approach:** The review is guided by Universal Design as its theoretical framework. A thematic analysis of peer-reviewed articles, scholarly works, and professional resources using targeted keywords, including "Universal Design," UD Models, and "Universal Design in Education," were identified and reviewed. **Results:** Results of the research contrast elements of multiple models in the context of higher education and provide insight for future research globally. **Conclusions:** Universal Design principles continue to evolve as viable frameworks for improving student outcomes in higher education. The most prominent models share similar characteristics and continue to show promise in helping all learners in various ways.

Keywords: universal design, online learning, quality course development, higher education **Paper type:** Critical Essay & Perspective

Introduction

College and university campuses have experienced a dynamic metamorphosis in student composition as they welcomed increasingly diverse students from differing cultures, socioeconomic backgrounds, ages, and abilities (Cumming & Rose, 2022). As the world continues to globalize through the transfer of knowledge, higher education continues to serve as an opportunity for individuals to continue their education and increase their skills without barriers such as geographical location, work schedule, or mental health support. While educational opportunities have expanded as technology has advanced, access to education has widened but it does not always equate to success. Higher education institutions can still struggle with student engagement and retention (Tani et al., 2021). The increasingly diverse student body necessitates the examination of creative strategies, practices, and pedagogies that provide nuanced flexibility in supporting a wide range of students virtually and in person, such as the student-athlete, a student with low vision, a mother working full-time and taking graduate courses online, or a young professional whose primary language is not English. Higher education institutions have adapted to the needs of the student body and continue to keep diversity and inclusion at the forefront of everyday practice to maintain equitable learning environments (Ramachandran & Sujathamalini, 2024). The wide-ranging needs of the student body in the 21st century, combined with increasing pressure in assessment, retention, and student success for faculty and administrators, resulting in a need for frameworks and solutions that serve many students while providing flexibility for specialized student segments. Multiple frameworks have been developed to enhance support for diverse student needs and provide a basis for continual improvement in instructional methods and course design (Higbee, 2008; Robinson & Wizer, 2016; Rose & Meyer, 2002); Shaw et al., 2001; Silver et al., 1998). The frameworks are commonly rooted in the principles of universal design.

While many of the elements of the universal design frameworks used in education seemingly overlap, their focus and lenses are quite different. The overview of multiple universal design models provided here demonstrates that the concept of universal design in education is far from settled. The findings provided open the door to continued discussions about Universal Design (UD) models in education and their role in reimaging the learning environment alongside the shifting demographics of the modern student.

Methodology

This research utilizes a qualitative, thematic analysis approach to review the existing scholarly work focusing on universal design principles in education. Looking at 28 sources on various universal design approaches, researchers analysed existing research to observe themes related to universal design in education. This research approach allows for an in-depth look at the complex patterns each universal design strategy poses and is appropriate for understanding the nuances of selecting, implementing, and maintaining various universal design approaches.

Researchers gathered data for this article to review necessary and relevant materials associated with each UD approach. These sources were gathered from various education and assessment-focused databases and/or academic journals, along with

general databases that house multidisciplinary approaches to education, including K-12 and higher education. The sources span from 2008 to 2024. Themes were compiled and reviewed for this article over a span of approximately six months. A global lens was applied to highlight the implications of global universal design, the complexities it may pose to the future of education, and what practitioners can do to prepare for an increasingly globalized world.

Qualitative research offers an opportunity to understand nuances associated with the approaches to universal design in the United States and world (Ostroff, 2011). While there is likely no one-size-fits-all-approach, employing a qualitative thematic analysis of universal design strategies may offer the best avenue to a better understanding which quality approach(es) to UD may best serve various student populations around the world without prescribing a single approach as the best way universally.

Background

Universal Design

Universal Design (UD) began as an architectural view and approach that emerged in the 1950s (Roberts et al., 2011). The origins of UDL are rooted in the concept of UD, an architectural view and approach that began to emerge in the 1950s (Roberts et al., 2011). UD created an entirely new design paradigm at the time that shifted focus to the users' needs and their individual experience. The term universal design (UD) was developed by Ronald Mace of North Carolina State University whose design philosophy was inclusive and forward-thinking. His vision of UD is best expressed as "Universal design is design that's usable by all people, to the greatest extent possible, without the need for adaptation or specialized design" (Ostroff, 2011, p. 34). The framework spread beyond architecture in the 1970s into other areas and industries and was eventually embraced as an alternative to the medical disability model in many areas of design (Fovet, 2021; Ostroff, 2011). In essence, designers across the world and a broad range of industries shifted their perspective in thinking from a finite medical disability model needing fixing or "accommodation", to a socially constructed model recognizing a wide range of differing experiences between environments and users. The design objective was to reduce friction and increase accessibility to an optimal "experience" versus accommodating a disability. The UD design lens began to develop improvements that reduced "friction" not just for a few users, but for many. Education, particularly higher education, is one of the practice areas that has gained popularity in applying UD.

Universal Design in Education

The application and growth of UD in education mimics its application in the field of architecture, with its beginnings grounded in accommodating the physical and mental abilities of students through tailored instructional design (Silver et al., 1998). The number of students confronting physical, mental, and learning challenges continues to grow, especially in the post COVID-19 crises years (Griful-Freixenet et al., 2017; Sokal, 2016; Wu et al., 2024). Determining the fairest and best way to meet the needs of all students can be difficult for institutions and instructors in colleges and universities. Research demonstrates that instructors have a significant impact on the educational experience of students in diverse settings and levels, emphasizing the need for

attention to instructional methods in an increasingly diverse classroom (Zhong et al., 2022). While institutions of higher education recognize some of the limitations perpetuated through historical biases such as ableism, it is often difficult for instructors to balance the needs of the students with the constraints of time and budgets (Fleet & Kondrashov, 2019; Sokal, 2016). Much of the tension between student needs and instructional methods is created through the historical adoption of an "accommodation" approach in the classroom. Most instruction still operates in a manner that centers on a medical model that requires the student to self-proclaim themselves as a "disabled" student to receive classroom accommodations that can optimize their learning experience and simplify accessibility (Fleet & Kondrashov, 2019).

The growing diversity in the modern higher education classroom demands instructors plan for varied abilities, backgrounds, along with life and learning styles. Models of UD in education can improve access and engagement for a wide range of students by proactively and strategically enhancing materials and feedback to support a diverse student population across campus and online environments. According to Martin and Bolliger (2023), "Design is critical in online learning" (p. 1218). Students who are enrolled in virtual classes need to know where to find the syllabus, modules, and various content with ease and have those expectations met similarly for each course.

Models of Universal Design in Higher Education

In recent decades, educators have embraced the value of universal design in improving accessibility and usability in the educational ecosystem (Rogers-Shaw et al., 2018). Modern educators use a wide range of models to guide the development of courses through universal design practices. The models employ a range of lenses to view instruction and develop curricula, from identity and continuous collegial collaboration and improvement to learner-centric and instructor-focused approaches. Some of the most prevalent and distinctive frameworks currently used by higher education professionals are described in the following sections.

Universal Instructional Design (UID)

Introduced in the years immediately following the passage of the Americans with Disabilities Act (ADA) of 1990, Universal Instructional Design (UID) was first explored through the eight principles of good practice and conceptualized by Silver, Bourke, and Strehorn (1998). UID was one of the first frameworks of UD to be applied in the context of higher education. UID focuses on accessibility, emphasizing universally designed materials that allow students with special needs and disabilities equal access to the curriculum. It is a simple instructional approach that improves efficiency and accessibility by anticipating common accommodational requests and making those tools readily available to all students who could benefit from their usage. The eight principles outlined in this framework, as noted in Table 1 (see Appendix A), establish a common theme of universal instructional design, recognizing the equitable potential of all students, despite learning differences, and the necessity of maintaining high academic standards while providing flexible access to content and assessment.

The model introduced by Silver et al. (1998) noted the importance of instructional training, strategies, and tools in student success. Their work pointed to an interesting barrier in the integration of UD principles in pedagogical practices by noting that most

faculty members are experts in their field, but not in pedagogy. These researchers found that instructors of K-12 classrooms receive significantly more formal pedagogical training to prepare them for the diversity of student barriers in learning than their counterparts in college and university settings. Their study highlighted the wide benefit of flexible instructional methods such as cooperative and contextual learning, scaffolding, pre-prepared materials, extended time allowances and interactive online content. Importantly, Silver et al. (1998) were early internet proponents who recognized the potential of technology in transforming the classroom experience for individuals with disabilities. Additionally, their work introduced the idea that the institutional culture and community must undergo a cultural transformation to bring integral and inclusive practices in instruction.

Today, the principles of UID are utilized individually as well as interwoven with other UD practices in higher education. For example, Goulden et al., (2023) emphasized UID as a method for modelling social work educational values in situ while students are in the classroom. They stress the use of UID in integrating instructional design and personalizing the learning experience for students with diverse needs in social work education. Additionally, Goulden and associates underscore the collective nature of the adoption and implementation of UID and advocate for leveraging communities of practice across countries and institutions to harness the benefits of UID and advance research on its efficacy, which still remains limited. Still, UID continues to be integrated and overlaid with other UD frameworks like Quality Matters (QM). Best (2019) recommended UID principles to develop QM standard 8, which addresses accessibility and usability, highlighting the potential of multiple UD frameworks and models used in tandem for the betterment of a broad array of educational contexts.

Quality Matters

As technology became more ubiquitous in distance learning, institutions began to recognize the need for strategic approaches to monitor the design and assess the outcomes in shared online learning environments. A consortium of colleagues wrestling with quality assurance in online courses eventually gave rise to the Quality Matters process. Quality Matters (QM) provides a “collaborative and collegial process that centers on continuous improvement” (Quality Matters, 2025a, para. 1).

Quality Matters began in the early 2000s with a Fund for the Improvement of Postsecondary Education (FIPSE) grant to Maryland Online (MOL), and eventually became an internationally recognized, subscription-based organization focused on the evaluation and continuous improvement goals on online courses in K-12 and Higher Education (Quality Matters, 2025b). While evaluating course design, a team of evaluators utilizes a rubric for intentionally designing courses to best fit the needs of both students and institutions. Throughout this process, as changes are made towards progress, it would not be uncommon for faculty members to resubmit their revised courses for additional evaluation, thus emphasizing the importance of providing the best assessment opportunities for all involved. It is certain that effectively supporting the online learning environment takes a wide array of institutional partners, and in doing so, leaders of these institutions are paving the way for sustainable course design and outcomes-focused approaches to learning (Watson, Piña, & Small, 2024).

At the core of Quality Matters is the Higher Education Rubric Standards, currently in its seventh edition (Quality Matters, 2025c),.which consists of eight general standards and 40+ specific review standards that are used to evaluate the design of online and blended courses. These standards provide a foundational and comprehensive framework that aims to address every angle of course design. They are as follows:

1. Course Overview and Introduction
2. Learning Objectives (Competencies)
3. Assessment and Measurement
4. Instructional Materials
5. Learning Activities and Learner Interaction
6. Course Technology (specifically incorporates technology)
7. Learner Support
8. Accessibility and Usability (para. 2)

Much of the QM certification framework complements principles found in other universal higher education approaches, while at the same time taking a more prescriptive stance requiring the use of specific rubrics and peer review processes. For example, QM encourages the use of technology, a variety of course materials, significant instructor-student interaction, and accessibility of images within the course. At the same time, the QM rubric differs somewhat from other educational UD models that support the "differentness" of learners such as tolerance for error, flexibility and attention to instructional climate, instead focusing on consistency of course design (Legon, 2015). Still, QM shares the common educational goal of increasing the student rate of course completion.

The QM process can be emphasized via the notion of continuous improvement, the vehicle of which are four principles: continuous, centered, collegial, and collaborative (Quality Matters, 2025a). Each of these principles works to ensure that a smooth, sustainable approach to development and learning can be prioritized. While the principles seem to be general, one thing is certain about this structure: it allows for a greater degree of inclusion, and as a result, strengthens the notion that all students deserve to have a learning environment that is going to serve them well (Brooks & Grady, 2022).

Universal Design for Instruction (UDI)

The Universal Design for Instruction (UDI) model developed by Shaw, Scott, and McGuire (2001), was one of the first educational frameworks to recognize the unique nuances of instruction in higher education when compared to K-12 environments. The underlying assumption of the framework rests on the premise that it is the responsibility of the college instructor to teach all students as effectively as possible without compromising academic standards and overall expectations. UD in education can contrast sharply with some traditional classroom practices that intentionally or unintentionally affect accessibility for students. For example, Friedensen (2018) emphasizes the use of UD principles in reconsidering "weed-out courses" and their impact on the diversity of STEM students. ←

The application of UDI is instruction-centric, guiding the instructor to create an inclusive environment for diverse learners. It emphasizes the functional integration of instructional strategies and planning methods that anticipate diverse student needs rather than waiting to develop accommodations on a case-by-case basis. The UDI framework anticipates “diverse abilities” rather than providing reactive solutions for “disabilities”. The proactive nature of UDI encourages instructors to engage in continuous self-reflection and improvement. Its nine principles are tied to seminal work in best practices for effective instruction as established by Chickering and Gamson (1987) and the early work of the Center for Applied Special Learning (Scott et al., 2003).

Universal Design for Learning (UDL)

Universal Design for Learning (UDL) is student-centric, emphasizing the needs of the learner. The basic guidelines for UDL address three core principles for instructors to use as guiding frameworks for instructors in designing and improving courses and classroom experiences. The four core principles include engagement, representation, action, and expression. Practices emphasize the why, what, and how of learning Rose & Meyer, 2002).

The guidelines for UDL implementation were updated in July 2024 to more explicitly emphasize the cultural and multidimensional intersection of assets, frameworks, and pedagogies (CAST, 2024). The revisions go further than previous iterations in elevating individuality and identity in both teaching and learning. While a good portion of the revised guidelines are changes in wording that subtly change the tone and tenor of previous guidelines, a portion of the new guidelines add emphasis on recognizing and addressing bias in modes of communication, expression, and methods that may result in exclusionary practices.

Despite the prevalence of UDL as a principle often pointed to in the field of higher education, the practice of UDL is often complex and challenging for faculty to implement in practice (Edyburn, 2010). There is a limited amount of research that has investigated the development of teaching skills to effectively incorporate UDL principles into teaching and learning approaches (Hromalik et al., 2020). However, according to Westine et al. (2019), investigating how faculty members adopt this approach is crucial in promoting the widespread adoption of Universal Design for Learning (UDL) in online education.

Evidence supports the use of Universal Design for Learning (UDL) as a tool for instructors to reflect on student learning in online training, as stated by Hromalik et al. (2020). Engaging in such introspection can provide positive outcomes in terms of enhancing classroom dynamics and ultimately enhancing the overall educational journey of all students, including non-traditional and graduate students as well as students from differing socio-economic backgrounds. For example, non-traditional students (NTS) often connect with other NTSs and form a unique camaraderie rooted in shared experiences and academic journeys. As student populations continue to diversify, instructors could use UDL to cultivate support communities more intentionally rooted in characteristics beyond basic demographics such as age, race, and major (McKenzie et al., 2024; Steinhauer & Lovell, 2021.) When considering the student experience and UDL, graduate and undergraduate students alike reported that their

level of motivation and connection to each other increased when UDL was embraced by instructors (Lohmann et al, 2018).

Integrated Multicultural Instructional Design

Integrated multicultural instructional design (IMID) is an approach to universal design in the classroom that considers social identity as a factor impacting learners (Higbee, 2008;). The guidelines include 15 items as noted in Table 1 (see Appendix A), emphasizing various perspectives and practices that recognize and value student differences. The design approach is rooted in first recognizing and appreciating diverse values, fostering trust and inclusion, and injecting multicultural perspectives throughout the learning process. At the same time, IMID encourages meaningful opportunities to explore the concepts of justice, equality, and charity and create meaningful interactions between students and faculty. Research for this universal design model seems to be more limited, but studies show positive student feedback in human-centered curricula like human resource development (Schultz & Higbee, 2011).

Table 1

Comparison of Universal Design Models in Education

	Universal Design for Instruction (UDI)	Universal Instructional Design (UID)	Universal Design for Learning (UDL)	Integrated Multicultural Instructional Design (IMID)	Quality Matters (QM)
Overview and Purpose	Focuses on creating accessible post-secondary instructional environments that are equitable and intuitive (Scott et al., 2003).	Aims to develop universal access in higher education for students with special needs through inclusive course components that may benefit all students (Silver et al., 1998).	Emphasizes flexibility in engagement, representation, and action to address diverse learner needs (CAST 2024; Rose & Meyer, 2002).	Addresses student diversity by integrating multicultural content and strategies for teaching to support all learners. (Higbee, 2008)	Ensures high-quality and blended learning experiences for continual improvement.
Foundational Concepts	Environment and Accessibility (Burgstahler, 2001)	Disability Laws (Rehabilitation Act, 1973 and ADA, 1990)	Neuroscience (*UDL & the Learning Brain*, 2018)	Social Identity (Higbee, 2008)	Quality Assurance, Continuous Improvements, and Benchmarking (*Quality Matters,2025a)*
Instructional Climate	Encourages a supportive and inclusive instructional climate, with high expectations for all students.	Focuses on creating a welcoming and supportive environment.	Fosters collaboration, belonging, and a positive emotional capacity for learning.	Promotes mutual respect and open dialogue between students and faculty, creating a sense of trust and belonging.	Provides support through clear expectations, instructor presence, and peer engagement

Feedback	Supports tolerance for error, allowing students to learn through mistakes. Feedback is integrated with instructional flexibility.	Provides clear, constructive feedback to help students grow, and offers multiple ways to assess understanding.	Focuses on providing feedback that encourages persistence and helps monitor and guide student progress through various methods.	Delivers timely and constructive feedback using culturally appropriate and responsive methods.	Emphasizes timely and actionable instructor feedback that is constructive and aligned with learning objectives.
Key Principles	1. Equitable use 2. Flexibility in Use 3. Simple and Intuitive Instruction 4. Perceptible Information 5. Tolerance for Error 6. Low Physical Effort 7. Size and Space for Approach and Use 8. Community of Learners 9. Instructional Climate	1. High Expectations for student potential 2. Opposed to "weed-out" mentality 3. Responsive to diverse learning needs 4. Use of methods that benefit all students 5. Maintain high academic standards 6. Commitment to multiple methods of instruction and assessment 7. Continual instruction improvement 8. Awareness of diverse learning styles	1. Welcoming interests and identities 2. Information is perceptible to all learners. 3. Materials and environment support interaction needs and preferences. 4. Sustaining effort and persistence 5. Clarify language and symbols 6. Multiple means of expression and communication 7. Supports and extends emotional capacity 8. Build usable knowledge 9. Develop meaningful strategies and measurements to support student progress. (CAST, 2024)	1. Value diversity 2. Commit to inclusion 3. Foster a welcoming environment. 4. Connect learning to real-world contexts 5. Develop key content 6. Integrate skill development with gaining knowledge 7. Set clear expectations. 8. Constructive Feedback 9. Include diverse cultural views 10. Highlight shared human values 11. Use technology to increase access 12. Adapt to different learning styles 13. Offer multiple ways to show learning 14. Assess fairly and sensitively 15. Encourage interaction and collaboration. (Higbee, 2008)	Continuous, centered on research and student learning, collegial, and collaborative, a peer-reviewed process (Snyder et al., 2024)
Customization & Flexibility	Provides various learning paths, accommodating different learning speeds and styles.	Incorporates diverse teaching methods to accommodate various learning styles and abilities.	Emphasizes flexibility in engagement, representation, and action to accommodate	Includes intentional flexibility in linguistic accommodations and cultural sensitivity based	Adapts to diverse disciplines and learning preferences by providing various

			different learner needs.	on class composition.	assessment methods.
Challenges	Strong focus on ability but lacks a clear vision for other identities: race, gender, etc.	Can face resistance to the process from teachers/learners who are committed to the status quo	Relies on student digital literacy. Some methods may create barriers for other students. (Cumming & Rose, 2022) (Griful-Freixenet et al., 2017)	Limited research with implementation guidance Requires training to address biases to implement effectively.	Ever-changing nature of education in today's world can be "prescriptive" in nature, with less space given for alternatives.

Source: Authors' Illustration (2025)

Discussion

Universal Design: Single Structure, Broad Impact, Individual Uses for Students

Universal design practices can help all students by making materials more accessible and by increasing flexibility in delivery and usage (Moriña et al., 2025) .Burgstahler and Russo-Gleicher (2015) provide interesting examples in how the value of universal design practices amplifies instructional efforts for students with diverse needs. For example, the researchers point out that providing video recordings of lectures for a face-to-face class has a wide range of benefits for the instructor and perhaps also for a wide range of students. A video captioned lecture recording can provide the legally required accommodation for deaf students unable to hear the audio (King & Piotrowski, 2021). At the same time, the lecture recording could allow English as a Second Language (ESL) students to go back and view sections in which they may be unsure of language translations or perhaps allow a student-athlete to view a missed lecture. A student who commutes could use the recording to listen to the audio on the way to campus or work, increasing their engagement in the content without increasing perceived time invested. One lecture recording could improve the accessibility and engagement for a diverse set of students while simultaneously multiplying the value of the time invested by the instructor in developing the videos and making them available.

Providing recordings of all lectures can require significant effort and may feel technologically burdensome to some faculty, but the time investment may be worth it for the instructor for a variety of reasons. The instructor can use the recordings to proactively address individual learning accommodations, which could expedite answers to individual student inquiries and then be used as a tool for future sections or alternative formats such as an online course. Video recordings of lectures are just one of the methods that can be utilized to improve the flexibility, organization, and accessibility of materials and activities.

Such proactive course design leveraging UDL principles improves accessibility (Casarez et al., 2019). Researchers have captured and documented a wide variety of applications of UD beyond lecture recordings that actively benefit all students. Some examples include posting slides ahead of time, using an e-book and offering multiple means of assessment like a paper or presentation (Kirsch et al., 2024).Research

shows that student satisfaction rises when courses are well-organized, flexible, and accessible (Black et al., 2015; Glazier & Harris, 2021; Yu, 2014).

Considerations for Higher Educational Universal Design

While improved usage of flexible instructional methods and accessible materials may improve engagement and satisfaction of students, it may not be an educational panacea. There is a danger of becoming too prescriptive in the approach to universal design instructional practices. Acton and Hujig (2020) warn against formulaic institutional checklists that literally and figuratively cause faculty members to "check the box" for universal elements. They warn that such processes can reduce radical innovation, the perceived urgency for marginalized students, and the overall strategic importance of universal design practices. Additionally, they note the duality of UDL demands placed on instructors to serve the student, yet faculty with needs similar to their students rarely receive individualized accommodations that benefit their professional practice of instructing.

Global Implications of UD and Sustainable Development Goal 4

Globally, the Sustainable Development Goals (SDGs) developed by the United Nations (UN) were created with the intent of engaging countries across the globe to create a more equitable world (United Nations, n.d.). SDG 4 works to promote high quality, equitable and lifelong learning opportunities for all ("Goal 4," n.d.) In that vein, Veytia Bucheli et al. (2024) suggest that UDL can be a useful tool for contributing toward equitable access of education for all, thus furthering SDG 4 in higher educational institutions around the world by revolutionizing information access and enabling flexible approaches to learning.

Worldwide, higher educational institutions increasingly strive to develop policies and parameters that are more inclusive, but in practice, they often find it challenging to implement inclusive practices (Oswal et al., 2025). UD contributes to SDG 4 globally by reducing barriers for marginalized and excluded groups by proactively designing curricula and materials to be accessible to all students, often using technology as an enabler (Veytia Bucheli et al., 2024). While technology has been a propelling force in UD implementation in higher education in many countries, various parts of the world (especially rural and socioeconomically challenged communities) struggle with providing equal accessibility to all students at all levels within the educational system (Khurana, 2019; Smith & De Arment, 2019; H. Zhang & Zhao, 2019).UD goes beyond the traditional view of "disabilities." In the traditional view, the understanding of a disability is based on the medical model of disabilities in which accessibility is a problem for the student, and accessibility is achieved through individual accommodations that may be provided through exclusive (and often temporary) content targeted to a narrow group of learners. Alternatively, UD views a disability through a social model of "different abilities" in which accessibility becomes a problem of course design, and accessibility is achieved through the implementation of UD principles through inclusive content with accessibility proactively built in to instructional design and delivery (Hills et al., 2022). In South Africa, UD is utilized to bridge the digital divide in distance education for those with disabilities and those without digital access in a post-apartheid environment by providing physical and digital access points and specialized exam arrangements for disabled students (Satar, 2019). Ultimately,

while the shift toward viewing disabilities as “different abilities” reflects a progressive shift in educational models through UD, it is imperative for faculty and other leaders in higher education to recognize the value in championing inclusive practices, especially in countries and cultures that may vary or lag behind in their efforts to accommodate or support students of all abilities.

UD also advances systematic educational reform by providing educational strategies and strategies and practices that improve adherence to governmental laws and institutional policies designed to maximize the learning of all students (Alvarez et al., 2019; H. Zhang & Zhao, 2019). The research of Manokore et al. (2024) advocates for UD as an essential framework in Zimbabwe in creating a more proactive and inclusive classroom environment for diverse teachers and learners, thus moving the cultural baseline of inclusivity beyond basic adherence to governmental laws and policies.

UD has improved learning outcomes around the world by improving faculty development and increasing student engagement. Globally, educators may have limited access to professional training in UD practices (Smith & De Arment, 2019). Multiple studies suggest that specific training in UD increases teaching competencies and enhances inclusive and effective pedagogical skills (Moriña et al., 2025; Oswal et al., 2025; Sanderson et al., 2022) Notably, a Global UDL Virtual Classroom project bridged cultural and technological barriers in UD implementation in Jamaica by pairing US faculty with Jamaican counterparts in a community of learning dedicated to professional development in UD. (Smith & De Arment, 2019). Such collaborations emphasize the importance of global communities of practice in diffusing UD practices globally. Ultimately, faculty in higher education serve as leaders in the classroom by developing inclusive pedagogies that enhance the learning of diverse students. Understanding and effectively and proactively implementing universal design principles can perpetuate an ethical stewardship of educational resources by signalling commitment to human rights frameworks and undergirding the implementation of SDG 4 for equitable access in global higher education with minimal increases to cost of delivery (Global Education Monitoring Report, 2020: Inclusion and Education: All Means All, 2020).

Future Research

Future research should include pragmatic solutions for instructors who have limited resources, ensuring that all learners have access and opportunity to have their needs met. Artificial intelligence is and continues to grow firmly embedded in educational settings, so there should be more time and energy given to studying the implications of emerging technologies in developing curriculum and materials that are rooted in socially just universal design principles (Hodgkinson-Williams & Trotter, 2018). Furthermore, universal design principles should be examined for emerging curriculum trends such as open-source textbooks (CAST, 2024). Globally, more research is needed outside the Global North to provide more robust insight into the application of UD beyond a Western view (Fovet 2021). While there are beginning points for universal design models to become a norm in global education, future research could begin with regionally. Lastly, there should be further study of the benefits of universal design for broader student populations beyond protected identities as well as for

faculty in classroom instruction efficiency/effectiveness (Black, Weinberg, & Brodwin, 2014; Higbee, 2008; Silver et al., 1998). In the coming decades, technology is sure to change the way we engage learners in the learning process. Universal design principles have an opportunity to fills gaps in this process, lessening barriers to learning overall.

Limitations

This article recognizes limitations such as highlighting that the discussion may not represent the full breadth of all Universal Design frameworks used in educational settings. Additionally, the review did not include primary, direct feedback from practitioners and students who have experienced and utilized these models. Furthermore, as a qualitative review, the discussion and findings are subject to the interpretation and possible bias of the authors. Despite these limitations, the study provides a valuable comparative overview of UD models used in higher education and identifies areas of future research for deeper exploration.

Conclusion

This study highlights the fundamental ideas, frameworks, and real-world applications of several of the key Universal Designs in Education (UDE) models in a variety of learning contexts. The study provides institutions and educators with a broad and comparative view of multiple approaches to universal design in higher education. Among the analyzed models, including UDI, UID, UDL, IMID, and QM, some recurring elements are evident, particularly the substantial advantages that universally designed teaching provides for all students. Overall, Universal Designs in Education has significant benefits for all students, with design being particularly critical in online learning (Martin & Bolliger, 2023). Principles of various UDE models can equip instructors at all levels to design with the student audience and voice as a primary driver of methods to increase student engagement in diverse classroom environments such as on-campus classrooms, online classrooms, hybrid and blended learning environments, etc.). As the diversity of student composition continues to change, regular training for teachers at all levels and modalities,and process enhancements through model updates like the Quality Matters framework and the 2024 CAST guidelines will be essential for the continuous improvement of UD's application in higher education. Such goal-oriented practices not only help improve instruction and support student learning but also necessitate institution-wide adoption and reinforcement by the administration and faculty leadership. Embedding and developing UD as both a strategic practice to support student success and cultural norms among faculty offers potential to improve retention and the student experience. Still, individuals and institutions should resist the temptation to take a rote checklist approach to simply symbolically or mechanically fulfill institutional universal design requirements, reducing creative thinking and innovation (Acton & Hujig, 2020). Ideally, universal design in higher education should offer courses that resemble well-constructed cities with several paths leading to the same place. While each student can successfully journey to the destination, the route will differ.

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