Faculty Research in Partnership with RIDIL

White Paper on Universal Design in Online Education

This white paper provides a summary of the work from:

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Overview

As online education gains popularity in K-12 and higher education, engaging and retaining the increasing diverse online learners and accommodating their diverse needs are becoming more and more challenging. Universal design (UD) has been perceived as a viable approach to reach the widest possible range of students in addressing their diverse needs. Different universal design frameworks have been proposed, including universal instructional design (UID), universal design for learning (UDL), and universal design for instruction (UDI).

Purpose of the Research

This article analyzed and synthesized studies from the last two decades that implemented universal design in online environments to have a comprehensive understanding of what role UD plays and how to apply it in online education, to provide insights into integrating UD in online environments. The guiding research questions are:

- What are the current trends in the literature on UD in online education?
- What are the instructors' and learners' attitudes toward UD applications in online learning?
- What evidence-based strategies have been used to implement UD?
- What are the impacts of integrating UD principles in online learning?
- What are the challenges in adopting UD strategies in online learning?

Method

To answer the research questions, the authors adopted a systematic review approach following PRISMA guidelines and process. This is a means of not only summarizing existing evidence while identifying gaps, but also providing a new perspective on this topic. The analysis of the selected 51 articles published between 2000-2022 underwent two phases with the first phase done through Google Forms by authors independently, and the second phase conducted via two rounds of coding using NVivo.

Findings and Discussion

The findings revealed multiple themes in answering each research questions that are applicable to researchers, instructors, and designers.

Trends of UD in online education

The findings highlighted some trends that are worthwhile to be aware of by researchers, instructors, and designers. (1). Despite a growing attention to UD in online education, the efforts of implementing UD in online education is still limited. (2). Most of these selected studies were conducted in higher education contexts while only a small portion were focused on K-12 online education, highlighting the gap in incorporating and studying UD in K-12 online settings. (3). Among the three major UD frameworks, UDL is the foundational framework for most of the selected articles focused on UD and online learning. (4). Considering the unbalanced implementation of UD among different disciplines, more disciplines need to incorporate UD in their online course design and implementation. (5). As UD has been implemented in different cases and contexts, its use goes beyond providing accessibility for learners with disabilities as it targets the widest possible population of learners.

Attitudes toward UD

Instructors' and students' attitudes were coded and categorized into three dimensions: affective, cognitive, and behavioral. Affective dimension refers to their reactions and feelings. Cognitive dimension is their perceptions and beliefs. Behavioral dimension is their behavioral intention and responses.

- Instructor attitudes. Affectively, most instructors showed passion and satisfaction toward UD implementation and about 30% stated the need for assistance in implementing UDL. Cognitively, instructors recognized the value and importance of UD to support diverse students and impacts on student outcomes. Faculty conceptualized UDI differently and perceived the need for UDI differently based on whether they perceived disabilities as a social model (i.e., it is society's creation of barriers that prevent people from accessing certain resources) or medical model (i.e., accessibility issues were due to individuals' health conditions). Behaviorally, some instructors intentionally did not apply UDL and did not have any desire to do so. A moderate to high interest in learning all UDL guidelines was reported.
- Student attitudes. Affectively, students reported high satisfaction and enjoyment courses designed following UDL and they were more motivated and connected with their projects. Cognitively, students found the course design helpful and practical, especially those with disabilities. Behaviorally, students preferred multiple project options, especially when they were inexperienced with online learning. The realization of the benefits of UD changed their class behaviors.

Evidence-based strategies

The report of the straggles followed UDL principles in presenting the categorized strategies since that was what existing studies followed. These strategy categories included: engagement, representation, action & expression, and assessment. A list of strategies under each category can be seen in the full manuscript.

Impacts of UD

Implementing UD principles and strategies in online courses had profound impacts on both instructors and students. The axial coding showed 11 major impacts on instructors including confidence in UDL, communication with students, knowledge of accessibility, lower pressure, students empathy, cross-cultural collaboration, UD knowledge increase, self-efficacy teaching online, transfer, instructional skills, and intentional design. For instance, instructors who attended professional development training or implemented UD strategies had enhanced knowledge, skills, and confidence in UD, showed positive transfer of learning, and improved awareness of accessibility. The use of UD can enhance instructors' instructional skills and make them more aware of intentional design. Instructors sometimes are pressured to design perfect projects. By letting students take ownership with alternative options, such pressure could be minimized. Providing multiple channels of communication can afford more transparent communication with students so that instructors can understand them better personally and professionally. UD can also support cross-university collaboration and intercultural conversations.

For students or student teachers, the studies reported a variety of positive impacts from different perspectives, which were coded into 11 categories: students' performance/outcomes, knowledge, attitude, engagement, accessibility, learning autonomy, interactions, authentic learning, interdisciplinary activity, transfer of learning, and retention. The explanations of these impacts can be seen in the full manuscript.

Challenges in adopting UD

Challenges reported were mainly focused on instructors, which can also become enablers when addressed. The axial codes and their description are summarized in Table 1.

Table 1. *Challenges for instructors to implement UD.*

Axial codes	Description
Support or resources	Lack of time or support to implement it and a lack of effective training to make this happen.
Competencies	Instructors lack the required knowledge or skills.
Attitude	Instructors showed resistance due to a combination of reasons such as concerns on evaluation on their course or viewing accessibility as a medical model.
Environment	Lack of incentives for instructors, lack of organizational initiatives, and students' lack of engagement.
Social	There is a lack of social support such as colleague's negative views

Conclusions

This systematic review analyzed the use of three major UD models (UID, UDL, and UDI) in online education and revealed the trends, strategies, impacts, challenges, and people's attitudes toward UD in teaching and learning. Recommendations were provided for integrating UD strategies in online education to target a wide population of learners beyond just providing accessibility. It is important to thoroughly understand the three

UD principles and align course goals with UD. Professional development and training in UD techniques and collaborations with peers can help overcome some challenges instructors face when implementing UD.

References