

Stacie Whinnery
University of West Florida
swhinnery@uwf.edu

Jennifer Mesa
University of West Florida

Keri Fogle
University of West Florida

Keith Whinnery
University of West Florida

IMPACT OF UDL INTEGRATION ON TEACHER CANDIDATES' KNOWLEDGE, PERCEPTIONS, AND ATTITUDES

Abstract

This paper explores a collaborative, cross-disciplinary curriculum reform effort on teacher candidate learning conducted at a regional comprehensive university in the Southeast U.S. The goal of this effort was to reform teacher preparation curriculum to prepare graduates to effectively teach students with disabilities (SWDs) in inclusive environments. Reform efforts focused on systematic integration of Universal Design for Learning (UDL) to prepare teacher candidates enrolled in a dual certification program (elementary/special education). A quasi-experimental, static-group comparison design was used to explore the impacts of the teacher education curriculum reform on candidate learning and attitudes. Surveys of student perceived knowledge and attitudes were conducted and application of the UDL framework within lesson plans was analyzed. Results indicate improvement in perceived knowledge and usefulness of the UDL framework and a broader application of UDL strategies in lesson planning.

Background/Rationale

More than 60% of students with disabilities (SWDs) receive at least 80% of instruction in general education (National Center for Education Statistics, 2016); therefore, teacher candidates must be well prepared to meet the needs of all learners. Teacher preparation programs can improve the skills and confidence of teacher candidates for inclusive education (Tangen & Beutel, 2017). Unfortunately, few reform efforts have included systematic coordination across general and special education (Blanton, Boveda, Munoz, & Pugach, 2017). A potential bridge that may connect both general and special education while allowing teachers in both disciplines to reach all learners in inclusive classrooms exists in Universal Design for Learning (UDL). Yet, research exploring how preservice teachers are prepared to use UDL in future classrooms is limited (Moore, Smith, Hollingshead, & Wojcik, 2018).

Universal Design for Learning is an instructional design framework for incorporating evidence-based practices into instruction to improve learning outcomes for students with and without disabilities by reducing learning barriers (Capp, 2017). The UDL framework rests upon

three instructional principles which include multiple means of representation, action/expression, and engagement (Meyer, Rose, & Gordon, 2014). Research suggests infusion of UDL into teacher preparation promotes candidates' selection of UDL strategies in lesson planning to promote engagement and learning (Spooner, Baker, Harris, Ahlgrim-Delzell, & Browder, 2007). Both Spooner et al. (2007) and Courey, Tappe, Siker, and LePage (2012) demonstrated positive effects of UDL training on teacher candidate lesson plan development. Edyburn (2000) argued, however, that UDL integration is not intuitive and can be challenging. Thus, teacher candidates will require training and guidance to effectively use UDL.

Purpose of Study

Although SWDs are typically included in general education classrooms, teachers are not always well prepared to effectively meet their learning needs (Spooner et al., 2007). Blanton and Pugach (2011) advocated for collaborative teacher education models that promote faculty collaboration across general and special education and merged curriculum to improve educational outcomes for SWDs. Guided by this, the present study utilized a curriculum reform model to support high levels of cross-disciplinary faculty collaboration and coordinated integration of content to support improved preparation of teacher candidates to become effective inclusive educators. This study explored the impact of a cross-disciplinary UDL curriculum enhancement on teacher candidates' knowledge and perceptions of UDL strategies and attitudes towards SWDs. Questions focused on whether candidates demonstrated changes in: (a) perceived and actual knowledge of UDL, (b) perceived confidence in using UDL strategies, (c) usefulness of UDL strategies, and (d) attitudes towards SWDs.

Method

A quasi-experimental, static-group comparison design was used for pre- and post-curriculum enhancement. A total of 65 candidates (32 pre and 33 post) participated in this study. Participants were enrolled in student teaching, the culminating clinical experience in a dual licensure program at a regional comprehensive university in the Southeast U.S. Using the Innovation Configuration for UDL (Israel, Ribuffo & Smith, 2014), faculty collaborated to systematically integrate UDL content across all content and clinical courses. Data sources included survey responses and lesson plans collected from candidates before and after the curriculum enhancement.

The survey was developed to assess candidate perceptions related to UDL and attitudes towards SWDs. The UDL perceptions subscale assessed candidates' perceived knowledge, confidence, and usefulness (KCU) of 14 essential UDL concepts and strategies addressed in the UDL curriculum enhancement. The KCU approach was based on previous surveys of teacher perceptions of professional development (Barton-Arwood, Morrow, Lane, & Jolivet, 2005; Lane et al., 2015). The second subscale included 14 Likert-type items focusing on candidate attitudes towards SWDs, specifically their commitment to ensuring the success of SWDs in the classroom. Reviews by content experts and cognitive interviews with candidates provided evidence of validity. In a pilot study, the reliability of the survey was found to be acceptable with Cronbach's alpha coefficients of .96 for the UDL perceptions items and .78 for the attitude items.

Survey results were analyzed using descriptive statistics, including means and standard deviations. Independent t-tests were additionally used to compare pre- and post-enhancement results for the following sections of the survey: perceived UDL knowledge, usefulness of UDL, and confidence in using UDL, as well as attitudes towards students with disabilities. Effect sizes were calculated using Cohen's *d* when significant differences ($p > 0.05$) were identified by the independent t-tests.

To explore application of UDL strategies, a random sample of 20 lesson plans (10 pre and 10 post) were collected and analyzed for use of the UDL principles and guidelines. Although a general lesson plan guide was provided to candidates to assist with their planning, candidates were not specifically prompted to use the UDL framework to address learning barriers.

Results

Following the curriculum enhancement, candidates reported significantly greater perceived knowledge and perceived usefulness of UDL as shown in Table 1. However, there were no significant changes in perceptions of confidence in using UDL or attitudes towards SWDs post curriculum enhancement.

Table 1
Pre and Post-curriculum Enhancement Survey Results

Survey items	Pre (n=32) <i>M(SD)</i>	Post (n=33) <i>M(SD)</i>	Effect size
Perceived UDL knowledge	46.84 (5.85)	51.19 (4.99)*	.80
Perceived confidence in using UDL	44.73 (7.27)	47.74 (5.98)	
Perceived usefulness of UDL	49.39 (5.44)	53.05 (3.85)*	.77
Attitudes towards students with disabilities	45.41 (3.54)	45.72 (1.42)	

* $p < .05$

The analysis of lesson plans indicated that both pre and post-enhancement groups consistently incorporated some strategies suggested in the UDL framework, such as activating prior knowledge, clarifying vocabulary, guiding practice, providing mastery feedback and reducing distractions. Following curriculum enhancements, candidates additionally incorporated strategies related to alternatives for auditory/visual information and highlighting critical features and patterns. We noted, however, few instances related to executive functioning, self-assessment and goal-setting, choice and autonomy, and self-regulation.

Discussion

The present study supported that systematic integration of the UDL Framework across a teacher preparation curriculum can have a positive impact on teacher candidate learning and development, but additional efforts may be needed to increase both self-confidence and application of a broader variety of UDL strategies. Results from the student survey support that students who participated in the UDL enhanced curriculum had significant gains in perceived knowledge of UDL. Additionally, the post-enhancement group expressed increased perceived usefulness of UDL strategies to reduce learning barriers. While there were positive mean score gains related to attitudes for teaching SWDs and perceived self-confidence using UDL strategies, these increases were not significant. Results appear to support that teacher candidates' attitudes towards teaching SWDs were positive prior to the intervention and remained so after UDL integration. Related to perceptions of confidence in using UDL strategies, the authors believe it would be beneficial to provide additional support and mentoring to help teacher candidates develop confidence generalizing UDL strategies from practice in methods courses to application in k-12 classrooms.

It was noted that both pre- and post-enhancement groups included UDL strategies commonly included in scripted curricula into their lesson plans. However, teacher candidates who experienced the UDL enhanced curriculum included a wider variety of UDL strategies mainly related to how teachers present new content through multiple means of representation. Authors noted a lack of UDL strategies designed to empower learners including strategies related to self-regulation and executive function. To broaden the variety of UDL strategies used, including empowerment strategies, it would be important to provide teacher candidates with intentional practice and guidance integrating UDL into lesson planning in k-12 classrooms.

Implications

Based on the results of our research we suggest:

1. Teacher candidates need support to transfer knowledge from methods courses to lesson planning in clinical experiences with purposeful use of UDL strategies
2. Teacher candidates need additional support and guidance to understand how to integrate UDL strategies not commonly used in scripted curricula into lesson plans
3. Teacher preparation programs should intentionally support the integration of UDL strategies related to executive functioning and self-regulation
4. Teacher preparation programs should collaborate with inservice teachers to enlist support in guiding teacher candidates to implement UDL in clinical experiences

Conclusion

This study demonstrated that systematic integration of UDL across courses and clinical experiences in a teacher preparation program can improve perceived knowledge and usefulness of UDL and broader use of UDL strategies. However, a focus on UDL strategies commonly used in school-district adopted curricula indicate that teacher candidates may need more intentionally focused practice and mentoring to include a wider variety of UDL strategies in lesson planning. Further, teacher education faculty should collaborate with school districts to support the generalization of UDL integration from methods courses to clinical experiences. We hope this study can help inform other teacher education programs interested in embedding the UDL framework into curriculum to support the development of effective inclusive educators

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