Building More Flexible Special Education Teachers: UDL Integration in a Dual-Licensure Program

AUTHORS
Keri C. Fogle
Jennifer C. Stark

Journal of Special Education Preparation
3(3), 28-37

DOI: 10.33043/JOSEP.3.3.28-37
openjournals.bsu.edu/JOSEP

ABSTRACT

In this article, we describe how our general and special education faculty collaborated to infuse the Universal Design for Learning framework into our special education preparation program, a dual-licensure special education and elementary education (K-6) undergraduate degree program. We describe the curriculum reform processes and outcomes of the UDL curriculum enhancement project, along with specific examples from multiple courses. Additionally, we highlight the need to continuously evaluate such efforts so that areas for improvement can be identified and addressed. For instance, we realized that our teacher candidates still needed more support to transfer what they learned about UDL from their coursework to their planning and practice in student teaching. In sum, we did not just create a plan, implement it, and consider it completed. We recognized a gap in the original plan, made improvements, and re-assessed, just as we would expect our teacher candidates to do when evaluating their own practice.

KEYWORDS

curriculum reform, dual licensure, preservice teacher preparation, Universal Design for Learning (UDL)

General education teachers are serving increasingly academically diverse classrooms across the United States, with more teachers indicating they are not as prepared to meet the varying-student needs (Bruggnick et al., 2015; Leko et al., 2015). Educator preparation programs (EPPs) have attempted to respond to the changing dynamics by creating coursework and programming designed to better prepare future educators to teach students with disabilities and all those who experience academic barriers in the learning process (Blanton & Pugach, 2011; Howerter et al., 2022; Tristani & Bassett-Gunter, 2020). Some EPPs have adapted by adding special education coursework to their general education curriculum, while others have moved to a blended approach, merging both general education and special education programming into a dual-licensure degree (Blanton & Pugach, 2011). Our educator preparation program already comprised a blended, dual-licensure degree, so a different approach was needed, and one that could provide a model for other EPPs in strengthening educator development.

In 2015, our teacher education department applied for and received a grant from the Collaboration for Effective Educator Development, Accountability, and Reform (CEEDAR) Center allowing us to implement a curriculum enhancement aimed at better preparing our program graduates to effectively teach students with varying needs while also guiding other institutions of higher education (IHE) interested in similar teacher education reforms. The CEEDAR Center, which operates through funding from the Office of Special Education Programs, provides technical assistance to state departments of education and IHEs across the country to build capacity among personnel preparation systems by preparing teachers and leaders to more effectively prepare students with disabilities to meet college and career readiness standards (CEEDAR Center, 2020). A team of four faculty

members (three special education, one science education) led the grant project and facilitated the curriculum enhancement process. In essence, our mission was two-fold: a) develop a model for collaborative cross-disciplinary reform in teacher education, and b) use the model to integrate Universal Design for Learning (UDL) into curricula for our two largest initial teacher certification programs: a dual-licensure (special education and elementary education) program and an elementary education licensure program. On average, about 50 dual-licensure candidates and 20 elementary education candidates graduate each year from our regional comprehensive university, which is situated in the southeastern US.

UDL is an educational framework that focuses on research-based practices that use flexible methods for optimizing teaching to meet the learning needs of increasingly diverse classrooms (Capp, 2017; Katz, 2015; Ok et al., 2017). The idea when planning with UDL is that barriers exist within the standard curriculum and teachers can minimize such barriers, thereby improving the academic outcomes for all students. UDL consists of three instructional principles which include: (a) varied ways of representing information, (b) multiple options for students to express their learning, and (c) flexible methods of motivating students to engage in the learning process (Meyer et al., 2014). Teachers can incorporate the three principles to proactively reduce learning barriers in the curriculum and increase student engagement through lessons that provide support and flexibility with the use of materials, technology, and classroom learning environments (Lohman et al., 2018). UDL is identified in the most recent federal legislation, the Every Student Succeeds Act (ESSA, 2015), where the expectation is that teachers can support the learning of all students by using UDL in assessment, instruction, and technology (CAST, 2016).

UDL CONTENT IN TEACHER PREPARATION PROGRAMS

Whether students have an identified disability or not, many teachers feel unprepared to identify specific student learning needs and support those needs through appropriate instruction (Cameron & Cook, 2007; Ross-Hill, 2009; Ruppar et al., 2016). The lack of adequate preparation for teaching students with disabilities may even contribute to increased rates of teacher turnover (Gilmour & Wehby, 2020). McCray and McHatton (2011) reported that teacher preparation programs do not prepare general education teachers with sufficient skills to meet the needs of today's diverse learners. Meanwhile, Vitelli (2015) found that few teacher preparation programs have integrated UDL into their curricula despite research indicating an improved selection of strategies among the lesson plans of general and special education candidates when programs infuse UDL into their curricula (Frey et al., 2012; Kahn et al., 2017; Reinhardt et al., 2021; Spooner et al., 2007; Williams et al., 2012). Evans et al. (2010) noted that integrating UDL was their solution to preparing effective special education teachers for increasingly diverse, under-resourced rural communities. Flanagan et al. (2022) even suggested implementing UDL practices in online course content for special education teachers by requiring candidates to first identify learning barriers and then add UDL practices in a graduated and purposeful manner. Likewise, Walker et al. (2022) incorporated UDL to create a more inclusive and cohesive curriculum in their small special education preparation program.

Our teacher education department wanted to be similarly systematic in our approach to infusing UDL into our curriculum, therefore we used the UDL innovation configuration (Israel et al., 2014) to guide our process. The UDL innovation configuration provides a comprehensive set of implementation recommendations for general and special education teacher preparation programs. According to this framework, teacher preparation programs should help candidates to develop both a deep understanding of the purpose and structure of the UDL framework as well as a set of skills related to planning instruction using the UDL framework. The essential UDL understandings identified in the UDL innovation configuration include ideas such as the proactive implementation of the UDL framework can improve the learning of students with varying needs across K-12 instructional contexts. The authors of the UDL innovation configuration further recommend that teacher preparation programs carefully support the candidates' translation of knowledge into practice in coursework and clinical experiences to ensure that they develop specific instructional planning skills. These skills include using the UDL principles, guidelines, and checkpoints to design accessible instruction and learning environments as well as using evidence-based practices and progress monitoring to maximize learning.

UDL CURRICULUM ENHANCEMENT PROCESS

Using a faculty-led learning community (FLCs) as our approach to supporting effective cross-disciplinary collaboration (Moore & Carter-Hicks, 2014), the general education and special education faculty in our department decided to integrate UDL across the 17 common courses and clinical experiences in the two programs (Whinnery et al., 2020). In our case, we used the CEEDAR grant opportunity to target cross-disciplinary collaboration since faculty in our depart-

FIGURE 1: Example Course Enhancements

Course	UDL Activities
Assessment	Use what you learned from the article to guide your assessment and analysis of the child's performance, curriculum, and instructional setting. CAST. (2020). *UDL tips for assessment.* Author. Retrieved from https://www.cast.org/products-services/resources/2020/udl-tips-assessments
Classroom environment	Use what you learned from the article to describe how you will organize your classroom to maximize academic engagement Minero, E. (2015, August 5). *Flexible seating elevates student engagement.* Edutopia. https://www.edutopia.org/practice/flexible-classrooms-providing-learning-environment-kids-need
Teaching English speakers of other languages (TESOL) methods	Based on the lesson, identify what guidelines are already incorporated into this lesson and how. What guidelines you could incorporate to help your English learner (EL) better understand the content and the process and by doing what?
Social studies methods	Modify history, civics, and multicultural activities to incorporate the guidelines (and checkpoints) for one or more of the UDL principles.
Mathematics methods	Identify and explain how you can use multiple means of representation such as a physical model, game, or technology to teach the mathematical concept.
Literacy methods	Administer assessments, create lesson plans based on assessment data, conduct lessons, and reflect on lesson outcomes during a clinical experience tutoring an elementary student in reading. Using the Universal Design for Learning (UDL) Guidelines, candidates reflect on their clinical experience.

FIGURE 2: Example Explicit Connections Between the 5E Instructional Model and UDL framework

PHASE OF 5E MODEL	UDL FRAMEWORK CHECKPOINTS
Engage: Find out what students may know and provoke curiosity about the lesson topic	7.2: Optimize relevance, value, and authenticity 3.1: Activate or supply background knowledge
Explore: Guide student exploration of phenomena through hands-on/virtual activities	2.5: Illustrate through multiple media
Explain: Debrief students on their explanations and evidence and introduce new concepts and terms	3.3 Highlight patterns, critical features, big ideas, and relationships 2.1 Clarify vocabulary and symbols
Elaborate: Guide student practice and application of new knowledge/skills	3.4 Maximize transfer and generalization
Evaluate: Assess student learning using various means both during and at the end of the lesson	8.4 Increase mastery oriented feedback

ment expressed the desire to integrate course content across disciplines in an intentional manner. Despite our department providing a dual, elementary education and special education degree option, our faculty historically operated in *silos* with limited collaboration across disciplines. Guided by the UDL innovation configuration (Israel et al., 2014), our general and special education faculty were able to collaboratively develop a common understanding of the UDL framework and systematically enhance courses throughout the program to (a) build student understanding of the UDL framework in foundational coursework; (b) provide clear examples of UDL applications across various instructional contexts in methods coursework; and (c) design practice opportunities for teacher candidates to use the UDL guidelines and checkpoints to address student variability in clinical experiences. Faculty worked together to study the UDL framework and innovation configuration before enhancing their courses with added instructional materials and activities related to UDL in their courses.

Course Enhancement Examples

Due to the large numbers of non-traditional students (e.g., working parents, para-professionals) and transfer students in our programs, we do not utilize a cohort model or hold our students to a strict course sequence. Instead, we provide a suggested course sequence to assist candidates with completing their programs in a timely manner. Elementary education and dual certification candidates are encouraged to complete the Educational Foundations course in either the first or second semester of their junior year. The IRIS UDL module (IRIS Center, 2016) was embedded in the Educational Foundations course to provide an introduction to the three UDL principles and how they could be applied to design curricula. More specifically, the IRIS module focuses on how the UDL framework can be applied to the four main curricular components (i.e., learning goals, instructional materials, instructional methods, and assessments) to meet the learning needs of all students in the general education classroom. After completing the module, candidates completed a quiz assessing their knowledge.

We advise candidates to complete the content area methods courses (e.g., math methods, science methods, social studies methods) in the second semester of their junior year or the first semester of their senior year. In these courses, faculty provide the IRIS UDL module along with additional options [e.g., UDL at a Glance video (CAST, 2016)] as a review of introductory UDL content. Each faculty member also created activities and assignments to encourage candidates to make connections to UDL in their individual courses as shown in Figure 1. More specifically, in the science methods course, teacher candidates identify examples of explicit connections between the UDL framework and the 5E framework, a research-based instructional model for facilitating inquiry-based science instruction (Bybee et al., 2015). Figure 2 contains examples of the explicit connections between the UDL framework and the 5E model shared by candidates in class discussions. Candidates also use the UDL framework to consider additional ways to address learner variability and maximize engagement and learning in class activities and when independently designing 5E lessons for their summative course assessment.

Assessing the Curriculum Enhancement

In order to examine the impact of our curriculum enhancement, we reviewed 20 randomly selected pre and post-lesson plans (10 pre and 10 post) from two groups of about 70 candidates enrolled in student teaching, the culminating clinical experience in the final semester of their degree program (Whinnery et al., 2019). The pre-enhancement group completed student teaching in fall 2016 and the post-enhancement group completed student teaching in spring 2018. Our university provided a general lesson plan template with sections for goals, methods, materials, and assessment as well as differentiation for all clinical experiences. At the time of the lesson plan review, the lesson plan template did not specifically prompt candidates to identify or address potential learning barriers using the UDL framework.

Our UDL team assessed the use of UDL within the lesson plans. We individually identified evidence of UDL checkpoints addressed within the 20 pre and post-lesson plans. Then we met as a group, discussed each lesson plan, and reached an agreement on whether the identified strategies were aligned with the UDL checkpoints. During these discussions, we often went back to the explanations and examples of UDL checkpoints on the CAST website to clarify our own understanding and help us to reach consensus on the match between a given strategy and checkpoint.

UDL CURRICULUM ENHANCEMENT RESULTS

The lesson plan analysis revealed that both pre and post-enhancement groups integrated some strategies aligned with the UDL framework. Checkpoints such as activating prior knowledge, offering guided practice, providing mastery-oriented feedback, clarifying vocabulary, and reducing distractions (UDL checkpoints 2.1, 3.1, 5.3, 7.3, and 8.4) were common across both groups. Figure 3 contains examples of common UDL checkpoints from our candidates' lesson plans.

However, following the curriculum enhancement, teacher candidates more often incorporated strategies such as offering alternatives for auditory information, highlighting critical

FIGURE 3: Examples of Common UDL Checkpoints From Pre- and Post-Lessons

UDL CHECKPOINTS	LESSON PLAN EXAMPLES
2.1 Clarify language and symbols	"Tell them that when we don't get along with others, a *conflict,* or a disagreement, can occur. Sometimes a third party may need to i*ntervene,* or get involved, to help solve the disagreement." (Post-lesson 1)
3.1 Activate background knowledge	"We have been learning about energy this week, and yesterday we learned about what changes energy can cause. Today we are going to be focusing on electricity." (Pre-lesson 1)
5.3 Build fluencies with graduated levels of support for practice and performance	"I will provide additional support for my two students who have trouble with number identification as I walk around the class observing. I will remind these students that they have a number line on their name tag and that they can use their 'magic finger' to track the numbers (just as we track when reading) to identify the numerals." (Pre-lesson 6)
7.3 Reduce threats and distractions	"They have the incentive of a group challenge to earn extra tickets for their group that can be used to 'purchase' things like lunch with a teacher, sitting in the teacher's chair, homework passes, and other desirable privileges. I will be keeping track of the groups, giving points to the groups as they work if they are on task." (Pre-lesson 1)
8.4 Increase mastery-oriented feedback	"On the activity sheet, students will label the parts of the plant and list three needs that a seed must have to grow. I will check for accuracy and assist any learner that needs remediation." (Pre-lesson 7)

FIGURE 4: Examples of UDL Checkpoints More Commonly Found in Post-Lessons

UDL CHECKPOINT	LESSON PLAN EXAMPLES
1.2 Offer alternatives for auditory information	"I will hold up the number word card 'Eighteen.' I will have the students say aloud what the card says. I will then place red/yellow counters under the document camera and I will have the class count along with me to 18." (Post-lesson 6)
3.3 Highlight patterns, critical features, big ideas, and relationships	"Generate words and phrases related to getting along with others. Model adding them to a graphic organizer." Candidate included an example concept map for "getting along." (Post-lesson 1)
8.3 Foster collaboration and community	"I will assign roles to each group member. One student will read the question and answer aloud, another student will write the answer and text evidence that the group agreed upon, and the last student will report the group's findings to the class." (Post-lesson 7)

features and patterns, and supporting peer collaboration (UDL checkpoints 1.2, 3.3, and 8.3) than candidates in the pre-enhancement group. Figure 4 highlights examples of checkpoints regularly implemented in the post-lesson plans. Contrary to the incorporation of additional elements of UDL in the post-enhancement curriculum, candidates rarely addressed many of the critical checkpoints for student engagement and action and expression.

CLOSING THE THEORY-TO-PRACTICE GAP

Senior Seminar

Based on the disparities identified in the lesson plan analysis, we realized that our teacher candidates needed more support to transfer what they learned about UDL from their coursework to their planning and practice in student teaching. In order to address this theory-to-practice gap, we designed a new session for student teachers in the corequisite senior seminar course. During the session, the instructor

FIGURE 5: Example Lesson, Class Profile, and Learning Barriers

Third Grade State Science Standard: Explain that stars can be different; some are smaller, some are larger, and some appear brighter than others; all except the Sun are so far away that they look like points of light.

Lesson Description:

1. Ms. Astro shows a Crash Course Kids YouTube video, "What are stars?" The video explains that stars can vary in size, color, and brightness.
2. Volunteers read sections from the textbook chapter, "What are the Sun and stars?" aloud for the class.
3. Students highlight the definitions of important terms as they read.
4. Students answer a few questions in their science notebooks such as, "Compare and contrast the Sun with other stars in the sky."

Class Profile:

- 3rd grade (10 boys, 8 girls)
- 6 students have IEPs (for SLD, ASD, and SI/LI) with varying levels of proficiency.
- 1 student has a 504 Plan addressing attention issues and on-task behavior. On-grade level in all academic areas.
- Remaining 11 students range from below to above grade level in all academic areas.

Possible Learning Barriers:

- Students may be overstimulated by the video and effects.
- Students are easily distracted by non-relevant information.
- Students may have difficulty understanding the speaker due to speed.
- Students may have difficulty reading grade-level text.
- Students may have difficulty writing complete responses in notebooks.
- Students may not have background experience in sky-gazing.
- Students may become frustrated with the pace of the lesson. Some may finish early. Some may require extra time.

briefly reviewed the UDL framework and the UDL lesson planning process (Ralabate, 2016), and modeled how to identify and address learning barriers in various content area lessons. Student teachers then completed a guided practice activity in which they anticipated possible learning barriers given descriptions of "typical" general education lessons and a profile of a class of diverse learners (see Figure 5). They completed this activity in small groups composed of both elementary education and dual-licensure candidates. Next, the student teachers selected one learning barrier and used the UDL framework to identify possible strategies to minimize that learning barrier in small groups. The following UDL planning tool (Sadler et al., 2016) was provided to guide their thinking (see Figure 6). Finally, the student teachers identified learning barriers and logical strategies based on the UDL framework in their individual lesson plans and unit plans for their formal observations. The UDL planning tool was added to the general lesson plan template for all student teachers.

Professional Development for Clinical Faculty and Cooperating Teachers

We realized that our clinical faculty and cooperating teachers had an essential role in guiding our candidates through the UDL lesson-planning process. They were the ones to review candidates' lesson plans, observe their teaching, and provide mastery-oriented feedback on their plans and practice. Although two clinical faculty members had participated in the curriculum enhancement process and one was a member of the UDL team, several new faculty and adjunct faculty had joined the clinical team in the meantime. Therefore, we offered a UDL refresher workshop in spring 2021 to review the UDL framework and clarify the specifics of the UDL lesson planning process for all of our clinical faculty.

In addition, we facilitated two-day UDL professional development workshops for cooperating teachers hosting our student teachers in the summers of 2021 and 2022. Both the workshops for clinical faculty and cooperating teachers highlighted the observed gaps from the lesson plan review (e.g., lack of support for executive functioning) and focused on selecting appropriate strategies to minimize barriers using the UDL framework. Clinical faculty and cooperating teachers also practiced matching barriers and strategies aligned with UDL checkpoints (see Figure 7) and using the UDL planning tool to identify logical strategies to reduce barriers in example lessons. Finally, clinical faculty and cooperating teachers in their respective workshops role-played how to provide feedback to teacher candidates so that they would deepen their knowledge of student variability and consider a wide range of strategies to reduce barriers in their lessons.

CONCLUSION AND IMPLICATIONS

Our attempts to integrate UDL into our preservice teacher education program highlighted challenges in the areas of faculty collaboration and continuous improvement related to internal and external priorities. Despite our department providing a dual, elementary education and special education degree option,

FIGURE 6: Example Completed UDL Planning Tool

Learning Barriers	UDL Principles	UDL Guidelines and Checkpoints	Strategies
Students are easily distracted by non-relevant information.	Engagement	Guideline 7: Recruiting interest Checkpoint 7.3: Minimize threats and distractions	Cue up the video so that it begins where the presenter discusses the question "What are stars?" (00:27). Pause the video after about thirty seconds to invite all students to discuss the information they recall hearing with their shoulder partners.
Students may not have background experience with star-gazing	Representation	Guideline 3: Options for Comprehension Checkpoint 3.1: Activate or supply background knowledge	Provide a virtual stargazing experience Time-lapse video Planetarium software (e.g., Stellarium)
Students may have difficulty writing complete explanations in science notebooks.	Action & Expression	Guideline 5: Options for Expression and Communication Checkpoint 5.2 Use tools for Construction and Composition	Provide sentence starters for notebook entries. Allow students to use speech to text feature in Google Docs to compose entries.

our faculty mostly operated in *silos* with limited collaboration across disciplines. The UDL curriculum enhancement process compelled our faculty to share expertise across courses (e.g., math methods, science methods, TESOL methods, and special education) and clinical experiences while simultaneously forcing faculty members out of their comfort zones by allowing access to courses for collaboration among the FLCs and critical friends. In doing so, we created a shared vision and common language of UDL and what that should mean within our individual courses. This breaking down of our own barriers allowed us to make substantial changes across the program by working collaboratively in a coordinated manner, providing preservice teacher candidates with opportunities to practice planning and implementing with UDL in mind (Israel et al., 2014). This experience demonstrates the power of collaboration across disciplines in teacher preparation and models a systematic approach of sharing perspectives that supports the development of effective inclusive educators.

This systematic enhancement approach assisted the department faculty in addressing both internal and external priorities. The faculty were united in their commitment to preparing new teachers who could provide flexible, supportive instruction for all learners. The enhancement process was in all possibility as successful as it was due to their commitment to continuous improvement in this focus area. Additionally, the description of the enhancement process provided rich evidence for the upcoming Council for the Accreditation of Educator Preparation (CAEP) accreditation self-study and formative review. In particular, the faculty were able to highlight how the department "systematically, and continuously assesses performance against its goals and relevant standards, tracks results over time, documents modifications and/or innovations and their effects on EPP outcomes" (CAEP, 2020). In retrospect, while maintaining CAEP accreditation was certainly important to the faculty (and their institution), the faculty's genuine desire to improve the teaching effectiveness of their candidates was the greatest driving force in the change process.

Perhaps the most important implication of our UDL curriculum enhancement was our recognition of the continuous improvement needed within the model. We began with a plan to intentionally implement UDL throughout our program and then measure the impact on candidate lesson planning as a consequence of those enhancements. However, an initial sampling of candidate lesson plans did not demonstrate the impact we had hoped for. A gap was identified within our enhancement plan and an additional layer of support for our students was implemented in the senior seminar. In a sense, we evaluated our program, made intentional actions to improve the quality of coursework in our program using UDL, and then made adjustments to our plans after further evaluating the results. Such continuous improvements in higher education are made amid a delicate balance of administrative support and

FIGURE 7: Expression Checkpoints Card Sort Key

Barrier 1: Some students struggle to complete their notes due to writing fatigue. **Matching strategy: H**	**Strategy A:** Provide formative feedback that helps students reflect on their own progress so they can use that information to guide their practice and use of reading strategies. (Checkpoint 6.4)
Barrier 2: Some students struggle with how to get started to achieve a goal (e.g., improving fluency in multiplication). **Matching strategy: D**	**Strategy B:** Put a box around irregular shapes. (Checkpoint 4.1)
Barrier 3: Some students struggle to cut out irregular shapes. **Matching strategy: B**	**Strategy C:** Provide multiple exemplars and vary scaffolding (e.g., writing frames) based on the needs of the learners. (Checkpoint 5.3)
Barrier 4: Some students have poor spelling and grammar skills and struggle to prepare and present a report. **Matching strategy: F**	**Strategy D:** Provide a guide for developing short-term action steps to reach a goal (Checkpoint 6.2)
Barrier 5: Students vary in their writing skills (i.e., some are able to write a full essay while others struggle to compose a single paragraph). **Matching strategy: C**	**Strategy E:** Teach students how to make an outline of key information from their notes (Checkpoint 6.3)
Barrier 6: Some students have difficulty writing goals to address identified weaknesses. **Matching strategy: G**	**Strategy F:** Allow students to use spell-checking software and/or web applications like Grammarly. (Checkpoint 5.2)
Barrier 7: Some students don't understand what to do differently to be more successful readers. **Matching strategy: A**	**Strategy G:** Provide examples and graduated scaffolds of a goal-setting process (Checkpoint 6.1)
Barrier 8: Some students have trouble pulling information from their notes and using it to complete a research project. **Matching strategy: E**	**Strategy H:** Allow students to use their Chromebooks to complete their notes (Checkpoint 4.2)

the academic systems within, such as the recognition of underlying cultures within our department and the usefulness of the objectives being implemented (Temponi, 2005). Not only was our administration fully supportive of our UDL initiative, our faculty believed UDL was a useful approach to improving candidate planning and preparation for teaching diverse learners. In order to move forward, they shed their underlying cultures of working in silos and fully engaged in cross-disciplinary collaboration through FLCs and critical friends. This willingness to implement curricular decisions in a meaningful way is unlike the norm in higher education (Hilliger et al., 2022), where teaching staff are often said to feel powerless and left out of curricular decision-making (Vican et al., 2020). When teaching staff are included in continuous improvement though, they become more involved in reform efforts (Manteufel & Karimi, 2021) as was the case with our enhancement. Secondary to the cross-disciplinary curricular enhancement was our recognition to assess outcomes and implement alterations as needed. We did not set forth a plan, implement it, and consider it completed. We recognized a gap in the original plan, made improvements, and re-assessed, just as we would expect our teacher candidates to do when evaluating their own practice. This form of program evaluation placed us in a unique position to better meet internal and external accountability standards for continuous improvement. Going forward, we hope to continue our work to advance other priorities in our department and conduct research on the long-term impacts of the UDL curriculum enhancement on our teacher candidates.

ABOUT THE AUTHORS

Keri Fogle

Keri Fogle is an Associate Professor of Special Education at the University of West Florida (UWF). Keri teaches special education courses in the dual licensure program and conducts research related to pre-service teacher preparation, para-to-teacher pathways, and parent-school relationships in special education.

Jennifer Stark

Jennifer Stark is an Associate Professor of Science Education at the University of West Florida (UWF). Jennifer teaches education courses for pre-service and in-service teachers, supervises student teachers, and conducts research on various aspects of teaching science, the development of teachers' knowledge and practices, and collaborative teacher education.

Acknowledgment

This work was supported by funding from the U.S. Department of Education (2020), Award Number H325A170003.

REFERENCES

Blanton, L. P., & Pugach, M.C. (2011). Using a classification system to probe the meaning of dual licensure in general and special education. *Teacher Education and Special Education, 34*(3), 219-234. https://doi.org/10.1177/0888406411404569

Blanton, L. P., Pugach, M. C., & Boveda, M. (2018). Interrogating the intersections between general and special education in the history of teacher education reform. *Journal of Teacher Education, 69*(4), 354-366. https://doi.org/10.1177/0022487118778539

Bybee, R., Taylor, J. A., Gardner, A., Van Scotter, P., Carlson Powell, J., Westbrook, A., & Landes, N. (2015). *The BSCS 5E instructional model*. NSTA Press.

Cameron, D. L., & Cook, B. G. (2007). Attitudes of preservice enrolled in an infusion preparation program regarding planning and accommodations for included students with mental retardation. *Education and Training in Developmental Disabilities, 42,* 353-363. https://login.ezproxy.lib.uwf.edu/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=eue&AN=507999448&site=ehost-live

Capp, M. J. (2017). The effectiveness of universal design for learning: A meta-analysis of literature between 2013 and 2016. *International Journal of Inclusive Education, 21*(8), 791-807. https://doi.org/10.1080/13603116.2017.1325074

Center for Applied Special Technology (CAST). (2022). *UDL in ESSA*. https://www.cast.org/news/2016/udl-in-the-essa

Center for Applied Special Technology (CAST). (2016, January 6). *UDL at a glance.* [Video]. YouTube. https://www.youtube.com/watch?v=bDvKnY0g6e4&feature=youtu.be

Council for the Accreditation of Educator Preparation (CAEP). (2020). *Standard 5: Quality Assurance System and Continuous Improvement.* CAEP. https://caepnet.org/standards/2022-itp/standard-5

Collaboration for Effective Educator Development, Accountability, and Reform (CEEDAR) Center. (2020). https://ceedar.education.ufl.edu/.

Evans, C., Williams, J. B., King, L., & Metcalf, D. (2010). Modeling, guided instruction, and application of UDL in a rural special education teacher preparation program. *Rural Special Education Quarterly*, *29*(4), 41-48. https://doi-org.ezproxy.lib.uwf.edu/10.1177/875687051002900409

Every Student Succeeds Act of 2015, Pub. L. No. 114-95 § 114 Stat. 1177 (2015-2016).

Flanagan, S.M., Howorth, S.K., Rooks-Ellis, D.L. & Taylor, J.P. (2022). Use of universal design for learning in online special educator preparation. *Journal of Special Education Preparation 2*(1), 20-27. https://doi.org/10.33043/JOSEP.2.1

Frey, T. J., Andres, D. K., McKeeman, L. A., & Lane, J. J. (2012). Collaboration by design: Integrating core pedagogical content and special education methods courses in a preservice secondary education program. *The Teacher Educator*, *47*(1), 45-66. https://doi.org/10.1080/08878730.2011.632473

Gilmour, A. F., & Wehby, J. H. (2020). The association between teaching students with disabilities and teacher turnover. *Journal of Educational Psychology, 112*(5), 1042–1060. https://doi.org/10.1037/edu0000394

Hilliger, I., Celis, S., & Perez-Sanagustin, M. (2022). Engaged versus disengaged teaching staff: A case study of continuous curriculum improvement in higher education. *Higher Education Policy, 35*(1), 81-101. https://doi.org/10.1057/s41307-020-00196-9

Howerter, C. S., Hughes, C. E., Sears, J., & Little, J. (2022). Two For one: Challenges and benefits of small elementary and special education dual certification programs. *Journal of Special Education Preparation*, *2*(2), 52-59. https://doi.org/10.33043/JOSEP.2.2.52-59

IRIS Center. (2016). *Universal design for learning: Creating a learning environment that challenges and engages all students*. Vanderbilt Peabody College. https://iris.peabody.vanderbilt.edu/module/udl/

Israel, M., Ribuffo, C., & Smith, S. (2014). *Universal Design for Learning: Recommendations for teacher preparation and professional development* (Document No. IC-7). Collaboration for Effective Educator, Development, Accountability, and Reform Center. http://ceedar.education.ufl.edu/tools/innovation-configurations/

Kahn, S., Pigman, R., & Ottley, J. (2017). A tale of two courses: Exploring teacher candidates'translation of science and special education methods instruction into inclusive science practices. *Journal of Science Education for Students with Disabilities*, *20*(1), 50-68. https://doi-org.ezproxy.lib.uwf.edu/10.14448/jsesd.08.0004

Katz, J. (2015). Implementing the three block model of universal design for learning: Effects on teachers' self-efficacy, stress, and job satisfaction in inclusive classrooms K-12. *International Journal of Inclusive Education, 19*(1), 1-20. https://doi.org/10.1080/13603116.2014.881569

Leko, M. M., Brownell, M. T., Sindelar, P. T., & Kiely, M. T. (2015). Envisioning the future of special education personnel preparation in a standards-based era. *Exceptional Children, 82*(1), 25-43. https://doi.org/10.1177/0014402915598782

Lohman, M.J., Boothe, K.A., Hathcote, A.R., & Turpin, A. (2018). Engaging graduate students in the online learning environment: A universal design for learning (UDL) approach to teacher preparation. *Networks: An Online Journal for Teacher Research, 20*(2). https://doi.org/10.4148/ 2470-6353.1264

Manteufel, R.D. & Karimi, A. (2021). Broad faculty participation in course-level evaluation of student outcomes supporting continuous improvement of an undergraduate engineering program. *Journal of High Education Theory and Practice, 21*(8), 159-165. https://doi.org/10.33423/jhetp.v21i8.4512

McCray, E. D., & McHatton, P. A. (2011). 'Less afraid to have them in my classroom': Understanding pre-service general educators' perceptions about inclusion. *Teacher Education Quarterly, 38,* 135-155. https://link.gale.com/apps/doc/A308599962/AONE?u=pens49866&sid=-bookmark-AONE&xid=a896574b

Meyer, A., Rose, D. H., & Gordon, D. (2014). *Universal design for learning: Theory and practice*. CAST [Center for Applied Special Technology].

Moore, J. A., & Carter-Hicks, J. (2014). Let's Talk! Facilitating a faculty learning community using a critical friends group approach. *International Journal for the Scholarship of Teaching & Learning, 8*(2), 1-17. https://doi.org/10.20429/ijsotl.2014.080209

Ok, M. W., Rao, K., Bryant, B. R., & McDougall, D. (2017). Universal design for learning in pre-K to grade 12 classrooms: A systematic review of research. *Exceptionality*, *25*(2), 116–138. http://dx.doi.org/10.1080/09362835.2016.1196450

Ralabate, P. K. (2016). *Your UDL lesson planner: The step-by-step guide for teaching all learners.* Brookes Publishing.

Reinhardt, K. S., Robertson, P. M., & Johnson, R. D. (2021). Connecting inquiry and Universal Design for Learning (UDL) to teacher candidates' emerging practice: Development of a signature pedagogy. *Educational Action Research*, 1-18. https://doi.org/10.1080/09650792.2021.1978303

Ross-Hill, R. (2009). Teacher attitude towards inclusion practices and special needs students. *Journal of Research in Special Education Needs, 9*(3), 188-198. https://doi.org/10.1111/j.1471-3802.2009.01135.x

Ruppar, A. L., Neeper, L. S., & Dalsen, J. (2016). Special education teachers' perceptions of preparedness to teach students with severe disabilities. *Research and Practice for Persons with Severe Disabilities*, *41*(4), 273-286. https://doi.org/10.1177/1540796916672843

Sadler, K., Thomas, C. N. & van Garderen, D. (2016, April). *Universal Design for Learning: Planning inquiry-based science experiences to reach diverse learners.* Workshop presented at the annual meeting of the Council for Exceptional Children, St. Louis, MO.

Spooner, F., Baker, J. N., Harris, A. A., Ahlgrim-Delzell, L., & Browder, D. M. (2007). Effects of training in universal design for learning on lesson plan development. *Remedial and Special Education*, *28*(2), 108-116. https://doi.org/10.1177/07419325070280020101

Temponi, C. (2005). Continuous improvement framework: Implications for academia. *Quality Assurance in Education, 13*(1), 17-36. https://doi.org/10.1108/09684880510578632

Tristani, L., & Bassett Gunter, R. (2020). Making the grade: Teacher training for inclusive education: A systematic review. *Journal of Research in Special Educational Needs*, *20*(3), 246-264. https://doi.org/10.1111/1471-3802.12483

Vican, S., Friedman, A., & Andreasen, R. (2020) Metrics, money, and managerialism: Faculty experiences of competing logics in higher education. *Journal of Higher Education, 91*(1), 139-164. https://doi.org/10.1080/00221546.2019.1615332

Vitelli, E.M. (2015). Universal design for learning: Are we teaching it to preservice general education teachers? *Journal of Special Education Technology, 30*(3), 166-178. https://doi.org/10.1177/0162643415618931

Walker, J.D., Lohmann, M. J., Boothe, K.A., & Owiny, R.L. (2022). Working smarter: Using universal design for learning to spiral curriculum in small special education preparation programs. *Journal of Special Education Preparation, 2*(2), 30-41. https://doi.org/10.33043/JOSEP.2.2.30-41

Whinnery, S., Fogle, K. C., Mesa, J., & Whinnery, K. (2020). Building collaborative teacher education: Integrating UDL through a faculty learning community. *Journal of Practitioner Research*. https://doi.org/10.5038/2379-9951.5.2.1161

Whinnery, S., Mesa, J., Fogle, K.C., & Whinnery, K. (2019). Impact of UDL Integration on Teacher Candidate's Knowledge, Perceptions, and Attitudes. In E. Markelz (Ed.) *Teacher Educator Division (TED) Conference Proceedings,* 87-91.

Williams, J., Evans, C., & King, L. (2012). The impact of universal design for learning instruction on lesson planning. *International Journal of Learning*, *18*(4), 213-222. https://doi.org/10.18848/1447-9494/CGP/v18i04/47587